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Recent reports in the news told of an Android app that promised adult material, but actually locked down phones and tablets and demanded users pay cash to gain access again. Of course, this is known as ransomware, and it's not limited to mobile devices. But is it a growing problem, and is there really anything we can do about it?

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58 Windows 10 So Far

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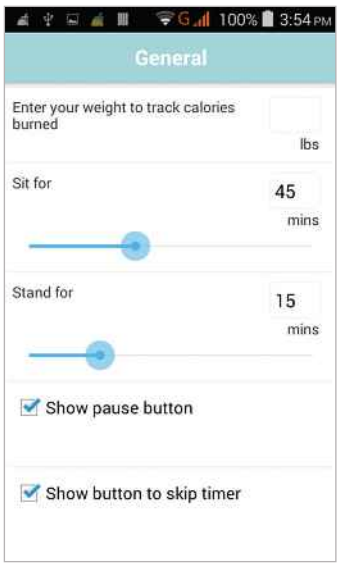

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The Rise of **Ransomware**

We look at the increasing growth of a particularly nasty form of malware

All forms of malware are unwanted, vicious and a pain in the backside. However, ransomware has always been particularly nasty in its execution. There's a certain level of vindictiveness about ransomware that separates it from the usual splurge of malware. Something a little sinister.

According to popular belief, the first example of ransomware appeared in 1989 and was called the 'AIDS trojan' or 'PC Cyborg'. It was, if you delve into the history of this particular form of malware, written by Dr Joseph L Popp, an anthropologist who was working on the Flying Doctors project as a part of the African Medical Research Foundation (AMREF). Popp wrote the AIDS trojan to be activated after 90 reboots, and on the 91st reboot the Autoexec.bat file would be replaced, and the entire file structure of the PC in question would be encrypted.

When the encryption was complete, a message would appear asking for $190 to be sent to a PO box in Panama, after which a recovery disk would be mailed to claim back your drive contents.

Popp was caught and detained in Brixton but was deported back to the US after being declared mentally unfit to stand trial. He died in 2007.

The effect of the AIDS trojan, though, was felt globally. Popp himself managed to mail out over 20,000 floppy disks containing the ransomware and uploaded many more to the smattering of bulletin boards that were available at the time. How much he actually made as a result of his holding users to ransom is unknown, but the criminal underworld and hackers alike suddenly found a new method of squeezing money from unsuspecting computer users as the home PC boom started to take off.

The encryption form of ransomware is just one example, but other forms include locking people out from areas of their system, usually by displaying pornographic images, until they pay a fee. This ransomware accuses users of downloading porn (in some even sicker cases, child porn) and threatens to inform the authorities until a payment is met, or it displays messages from such agencies as the FBI, claiming that the user's computer has been used for illegal activities and that they have to pay a fine of several hundred dollars. There was even one instance where Russian ransomware demanded images of the users in various states of undress and conducting lewd scenes before the system was apparently declared clean.

Generally though, most ransomware examples are the kind that infect a user's browser, changing the home page and targeting them with countless adverts for pharmaceutical enhancements, nice young Russian ladies who seem to want to meet up with you and some of the more explicit images that are available throughout the internet.

Mostly these require you to download and install another tool, which could either do something useful, like cleaning your system, or something bad, like simply bombarding you with countless more adverts. Or it could involve something a little worse by installing yet another trojan, which captures keystrokes, passwords or, in some cases, can allow an external user to control your PC.

Social Engineering

While a terrible blight on the face of technology, ransomware does offer some insight into human behaviour.

The social engineers used to extract money or some other form of ransom from a user is really quite fascinating. Take, for example, the aforementioned warnings from government agencies. Realistically, how many of you reading this would be fooled by a personalised warning from the FBI? Yet it happens all too regularly.

The same can be said for phone-based ransomware. Most of us have had that chap on the other end of the line claiming that there's a problem with our Windows PCs and that he'll be able to fix it for a minor fee, as long as we download a program that will give his team of experts access to our system.

> **“There's a certain level of vindictiveness about ransomware that separates it from the usual splurge of malware. Something a little sinister”**

Perhaps it's the fear of the unknown that causes people to believe in these callers, in the same way that they believe an agency that has spent millions trying to oust Castro is currently gunning for them personally.

Perhaps we've downloaded something we shouldn't have in the past (an MP3, for example) or we've accidentally clicked on something that revealed a pornographic image. The guilt of something like that can have an effect, and when someone suddenly appears and preys on that guilt, those susceptible to such feelings take the bait.

The social engineering aspect is a difficult weakness to combat, because it's not as straightforward as simply installing an AV/malware scanner to combat a digital weakness and keeping it up to date. There's an element of education needed, which we'll look at later, but with human nature being what it is, this isn't

always the easiest solution to the problem – especially as the 'art' of ransomware is expanding into new territories.

Ransom On The Go

Ransomware, in all its guises and uses, did appear to settle down somewhat a couple of years ago. The majority of cases were of the phone-based, 'We're from Windows' variety, rather than actual downloaded and installed stuff that displays some kind of message asking for payment or some other form of ransom. The worst instance of 2013 was undoubtedly the CryptoLocker and its variants that appeared months later, CryptoLocker.F and TorrentLocker. However, these were isolated after having infected the Australian Broadcasting Corporation and were, to a degree, laid to rest while the world updated its virus and malware scanners.

Over the last year, though, anti-virus software companies are starting to see a rise in the instances of ransomware once more. And it looks like this particular breed may turn out to be far worse than the previous generation's offerings.

While the PC was the main affected platform of the past, a new outbreak is starting to hit mobile devices, in particular Android phones and tablets.

One example, known as Android.trojan.SLocker, is a form of ransomware that arrives via an email disguised as an update to Adobe Flash Player, and it will lock you out of your images and media folders until it receives payment of $500, demanded by a fake FBI warning that appears on the screen, claiming that you've been caught looking at porn.

As most of us who follow technology already know, Flash isn't being updated any more for the mobile platform, but to the thousands of users who aren't aware of this and are likely to fall for it, the situation is beginning to get out of control.

BitDefender has identified that Android.trojan.SLocker is affecting nearly 3,000 devices per month, with a huge jump in February of this year from a mere thousand cases. While still reasonably low, considering the number of Android devices there are in the world, what's worrying most analysts is the fact that around 90% of active Android devices don't have any kind of protection installed on them, and most even allow the installation of apps from unidentified sources.

mobile device ransomware has become much easier to deploy due to the user-friendly graphical interfaces now used on phones and tablets. There's also the fact that many mobile device users are too young to consider the implications of not actually reading something or investigating its legitimacy before blindly tapping the OK button.

With ransomware examples such as Koler, SLocker, trojan.Android, SVPENG, Lockscreen and ScarePackage, Android appears to be bearing the brunt of the

> **A recent report released by F-Secure has identified a number of potential ransomware threats that are currently probing the outer edges of the iOS security envelope**

McAfee Labs also reported a 58% rise in ransomware samples from mobile devices in the last couple of months, mostly originating from Russia and the Ukraine. Surprisingly, the most hit users were those who use Android mobile devices for work, where they've been targeted with an email, unknowingly installed the ransomware and paid the amount in fear of being caught by their employer using a work device for illegal activities – even if they've never conducted any illegal activities on any computer or device!

The detection is then picked up once they return to base and submit their phones or tablets or once connected to the company servers and caught by the AV server.

Raj Samani of Intel Security mentioned in a McAfee blog (**goo.gl/Qjhvmf**) that attacks so far, with 61 identified different ransomware examples discovered this year alone – obviously due to its open-like nature. However, those with iOS devices may need to keep an on their products as well.

iOS Infiltration

A recent report released by F-Secure has identified a number of potential ransomware threats that are currently probing the outer edges of the iOS security envelope.

EXPLOIT:iPHONEOS/CVE-2014-4377 is a cleverly designed PDF document, which when opened on an iOS device using unpatched versions of iOS 7.1x can exploit the CVE-2014-4377 flaw that exists on the system. This will, in theory at least, grant an external attacker the ability to exploit further

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security flaws in order to remotely execute code on the system.

TROJAN-SPY:iPHONEOS and WireLurker are mostly found in pirated apps and third-party pirate app sites for OS X systems. Any iOS device that's connected to an infected Mac via USB can have an equally infected app downloaded on to them. Apple has since responded by blocking all WireLurker detected apps in the iTunes Store.

BackDoor:iPHONEOS/XSSER is a combination of tools that have been ported over from Android and is capable of harvesting data, such as SMS texts and stored photos. So far, it only seems to affect jailbroken iOS devices, but the potential for a sudden lurch into the mainstream device users is there, and the ransomware possibilities are quite scary as a result.

The Curse Of Cryptocurrencies

One major advantage for the ransomware criminal is the sudden rise of cryptocurrencies over the last couple of years. Although BitCoin was in full use in 2009, there have since been many more additions to the market – more than 670 by today's count.

The likes of Aurorcoin, BlackCoin, Dash, Dodgecoin, Litecoin and Ethereum are just some of the more notable means by which a ransomware criminal can extract money from an infected user while still remaining safely anonymous – as credit card transactions can be traced, blocked an so on.

While cryptocurrencies have many positive uses, like allowing people to pay for services or goods without the usual banks, credit agencies and so on tracking their every move, the inherent anonymity of them is also allowing the criminal fraternity a clean getaway when it comes to trying to track the source of a ransomware attack.

As Mikko Hypponen, F-Secure's chief research officer, said recently, "Because of virtual currencies, it's becoming a lot easier for criminals to use ransomware, making it more profitable and more useful for them."

How Does Most Ransomware Get On Your System?

There are different points of access for ransomware, but to quote the BitDefender Tech Help, "Most likely it happened when you accessed a website containing malicious scripts. These can be hidden under the form of:

- A browser plug-in or extension (typically a toolbar).
- A multimedia codec required to play a certain video clip.
- Software shared on peer-to-peer networks.
- A free online malware scanning service.

The infection will take over the computer within moments. At the next restart, you will notice you are unable to access Windows unless you pay a ransom."

According to F-Secure, a lot of the attacks that demand cryptocurrency are originating from China, using the county's Great Cannon extension of the Great Firewall in much the same way that Chinese hackers brought down GitHub a few months ago.

Social Media Ransomware

The ever increasing rise of social media brings with it a new form of ransomware. With over 1.3 billion users logging into a social media site of some description monthly (source: **www.searchenginejournal.com**) and the increasingly open profiles of users, it's little wonder why.

Take an average user, for example: they're just one of that 1.3 billion, but from viewing their profile – without them even being aware of it or 'friending' them – a ransomware attacker is able to find out the user's full name, date of birth, workplace, interests, hobbies, skills, relationship status, likes and dislikes. In some cases, their phone numbers, contacts and email addresses can be viewed.

From that basic information, an attacker can send a personally crafted email to the user, they can target particular contacts (work or private) and threaten the user into handing over money. And they can target the user's Likes, tricking them to click something that would appeal to them, thus installing or downloading an active ransomware code.

Unbelievably, according to InternetSafety.org, 66% of adult Facebook users don't know or are completely unaware of the privacy controls. 71% of consumer purchasing is based on what they see via social media. And 26% of social media users have made an in-app purchase with their credit cards. This all accumulates fodder for a ransomware attack – and criminals don't even need to sit there and go through profiles themselves, because there are bots that collect that data for them.

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Ransomware Growth

Looking back at everything we've discussed so far, it's little wonder that ransomware is beginning to come back in a big way.

The number of unprotected Android devices, the possible beginning of iOS infiltration and the increase in viewable personal data has given rise to more opportunities for ransomware attackers. Couple this with the ability to remain mostly anonymous from the authorities by using virtual currencies and hiding behind country-wide firewalls and such, and it's quite amazing that the number of ransomware instances isn't bigger.

One of the major problems, though, with tracking a ransomware attack is the simple fact that many of them are never reported.

The current numbers generated by the various AV firms are just the tip of the iceberg, as users who have fallen for ransomware are either scared of the repercussions of being targeted and essentially scammed or are embarrassed to admit it. So while the ones we do know of are being tackled by the authorities as best they can, a vast number of attackers are getting away with it.

What Can We Do About It?

There are a number of different ways we can tackle ransomware attacks. The first and foremost is to make sure that you, as both a PC and mobile user, have adequate security and malware protection installed on your system and devices, and that you keep it up to date.

Most attacks are based on malicious code, targeting a vulnerability of some form, inherent to the system. With proper system patching, installing updates instead of ignoring them, and making sure that your anti-virus provider is up to date with the latest trends, you'll be able to fend off most of the potential ransomware attacks. Also, it's worth noting that most AV companies have the ability to decrypt a ransomware locked PC with their own software, which means you won't need to contact the attackers.

Education is something we mentioned earlier in the article and, as we said, it's one of the more difficult aspects of ransomware combat to nail down.

A lot of humans, it appears, don't like to take good advice. No matter how many times someone informs them that the chap on the other end of the phone isn't from Microsoft and doesn't have in front of them a light indicating that your computer has a virus, they'll somehow continue to believe these calls.

Likewise, the fact that 66% of users don't know how to configure a Facebook privacy setting is equally scary.

So how would we deal with the education of the technological masses?

Perhaps more advertising campaigns on TV or radio would help. Maybe even a story line in the nation's favourite soap about someone falling for a ransomware attack might do the trick? For the time being, we'll just have to keep on telling everyone that these types of calls or FBI warnings are fake and that they shouldn't contact or click on anything until they've sought professional IT advice.

> **“Reporting a ransomware attack isn't always an easy thing to do. For the majority of cases, the local police are unfortunately powerless”**

Speaking of social media, to avoid any targeted attacks on you or someone you know, you need to have a look at what's currently visible to the general public.

Perhaps the Facebook user could ask someone who currently isn't their friend to look them up and see exactly what information can be gleaned from their account. Also, with settings being changed through updates to the service, social media users should really be continually reviewing their security settings on a regular basis. This way, should an update alter a setting, the user can adjust accordingly to keep their profile private.

However, it's a lot of effort for a casual user. Perhaps, then, the likes of

SimpleLocker, The First Android Ransomware

F-Secure was one of the first companies to track the Android ransomware code known as SimpleLocker. As it explains, "Upon installation, this fake video player app searches for user files on the Android device's SD card such as images, documents, video, etc."

The trojan will then use AES encryption to lock the files, then it displays a message in Cyrillic asking for the equivalent of around £15. The money was to be paid to internet kiosks popular in Eastern Europe, where the ransomware was thought to originate, and unless payment was met within 24, all the files would be destroyed along with the cryptographic keys needed to unlock the device.

In addition, unless the user paid up, a threat was issued that every so many hours a contact from their address book would be given evidence that the user visited some of the worst examples of pornography on the internet, and that it would also download examples of those clips to the device for the police to find.

Nasty, eh?

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Facebook or Twitter should make all critical information private to begin with

Above all, though, the best advice you can give to someone is to not give in to a ransomware attack. Paying off the ransom to unlock your files will most likely, as we said earlier, result in more malware appearing on your system. Remember, these are criminals you're dealing with here; they have little regard for what's yours and even less interest in the data that they're stopping you from accessing.

No matter how tempting it is, it's probably best you don't go visiting sites where you're likely to pick up some malicious code. Porn sites are an obvious place to avoid, as are the various illegal download sites for movies, music and so on. But also avoid pirated app sites, and certainly don't go installing such apps on your device. The app in question may work, and you haven't paid for it, but it'll more than likely contain other code beyond the actual stuff needed for the app to work.

We keep saying this, but backing up your information to a source other than an attached, secondary hard drive will allow you restart and rebuild your computer in the event of an infection.

While it's not ideal, at least you can start again, wipe the drive and restore your work and data with the ransomware gone – hopefully now a little wiser.

Finally, never allow someone you don't know to have control of your PC remotely. It may sound obvious, but the phone scam ransom works in this way, and there have already been millions paid by unwitting victims. The chances are they'll install something on your system to spy on your accounts or they'll simply lift the data straight from your drive while they run some useless so-called scan.

What To Do Next?

Reporting a ransomware attack isn't always an easy thing to do. For the majority of cases, the local police are unfortunately powerless.

If you've already paid the ransom, then there's a reasonable chance you could claim it back from your bank. After all, you've been the victim of online fraud, and there are measures in place to help you in such circumstances.

If you suddenly have a warning from the FBI or Metropolitan police on your screen, asking for money, then your best bet is to look to anti-virus forums – on another system, obviously.

Big Numbers

According to Norton, there are some scary statistics available for those who love to see how malware affects us in terms of numbers. To quote the company:

"Symantec experts analysed how criminals monetise the scheme. In the month-long period the experts studied one specific attack in more detail. 2.9% of compromised users paid out. This may seem like a small percentage, but it pays off for the criminals:

During the month, 68,000 computers were infected: the equivalent of 5,700 every day.

Ransomware typically charges between $60 to $200 to unlock the computer.

On a single day, 2.9% or 168 users paid the ransomware, permitting the criminals to potentially earn $33,600, which means the criminals could have made up to $394,000 in one month.

However, given the number of different malware variants and criminal gangs operating ransomware attacks, an estimated $5 million is being extorted from victims per year."

Android Ransomware

Symantec said in its report, One ransomware campaign conned victims into parting with a total of $400,000 in a single month.

Believe it or not, almost 3 percent of those infected have actually paid the ransom

With more than $5 million a year stolen from unsuspecting victims

> **"Never allow someone you don't know to have control of your PC remotely"**

BitDefender has a Tech Assist page dedicated to helping you and offering advice and downloads to clean the infection off your PC. Other than that, most local computer engineers or shops will be able to help out, as well as some of the notable repair companies in this or other magazines.

Will Ransomware Ever Die Out?

The chances are, no. It'll evolve into new and varied forms as technology evolves. All we can do in such circumstances is stay as vigilant as possible, keep everything up to date, avoid going to places where it's likely to appear and try to inform everyone of the various scams and ransomware threats that are around.

What we'll most likely see in the coming months are targeted ransomware attacks on users' cloud accounts and services and, of course, an increase in mobile attacks. Either way, it's enough to make you want to be technology free. **mm**

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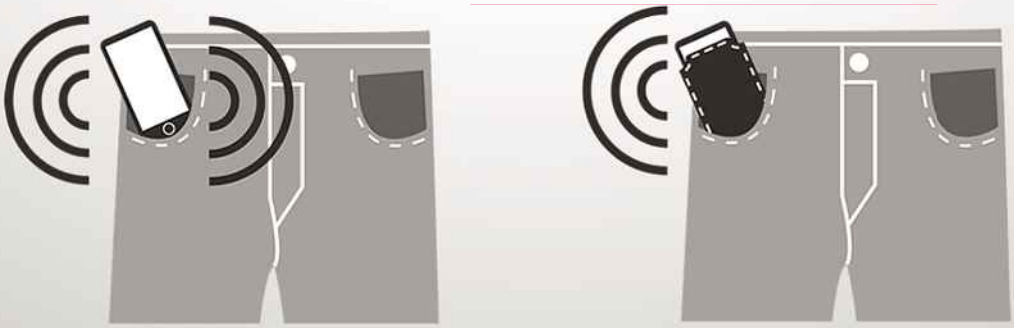

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Google's OnHub Router

David Briddock explains why OnHub is no ordinary wireless router.

These days Google seems to make technology news headlines almost every week as it continues to diversify from its search and online ad origins. Driverless cars, touch-interactive textiles, green power technology and even smart contact lens for diabetes patients are just a few of its well publicised innovations. This time they've teamed up with networking device manufacturer TP-Link to build the Google OnHub router (**on.google.com/hub**).

Making It Simpler

The drive to build a new router came about after the company started an exercise to analyse how people cope with current wi-fi technology in the home. As Google product manager Trond Wuellner says, "We spent a lot of time with people who were having all kinds of trouble with their wi-fi."

Wuellner has been at Google for eight years. Having spent much of this time working on wireless connectivity for Chromebooks he knows a thing or two about setting up and managing a wif-fi network. He certainly understands it's a big problem for some, and thinks he can help. Wuellner believes the Google OnHub is sleeker, more reliable, more secure and, most importantly, much easier to use than any of the other long-established alternatives; he could well be right. So let's check out the details and see why Google think they've moved the router technology goalposts.

Home-centric Design

One of the most striking things about OnHub is the way it looks. This is entirely intentional and an important goal in Google's longterm plans. Google and TP-Link say that a router performs at its best when it's out in the open, say placed on a shelf or cabinet, where its antennas aren't being blocked in any way. As Wuellner says: "Many of us keep our router on the floor and out of sight, where it doesn't work as well. We discovered that when you put a router on the floor, versus on the shelf, the one on the shelf performs twice as well as the one on the floor."

So an attractive design is key to ensuring a prominent placement. On first glance OnHub looks a little like a vase. That's intentional as this kind of shape means it's less likely to be covered over in the interests of interior design. The outer shell is removable so the colour can be changed to suit the setting. Currently there's only blue or black, but Google say more colours are on their way.

So as not to compromise the clean design lines the traditional array of blinking or solid LEDs has been omitted. Instead the top of the OnHub cycles through different colours, with Green signifying all is okay.

Advanced Hardware

Inside the OnHub there's a unique circular array of 13 antennas. Twelve of these are dedicated to broadcasting signals; six operating at 5GHz and six at 2.4GHz. The final antenna is used to measure congestion within the network. Google asserts that with this configuration, speeds of up to 1900Mb/s are possible.

Trond Wuellner

The device constantly monitors channels and frequencies to ensure the wireless connections operate at peak levels. While the congestion-sensing aspect is designed to obtain the best possible range and data speed in all situations.

One of the flip-sides of the concentration on aesthetics, however, is that OnHub isn't big on ports. It's only has a single free Ethernet port, after the other is connected to a WAN modem. Plus there's a solitary USB 3.0 port at your disposal for basic file sharing. Considering the relatively high price a few more ports would no doubt be welcomed by many. However, as Google is keen to emphasise on the product page, the OnHub is, "built for all the ways you wi-fi."

Smart Software

As you'd expect OnHub supports the latest in wi-fi and Bluetooth standards, but the onboard software is pretty smart too. During setup, OnHub searches the airwaves and selects the best channel for the fastest connection. Working away in the background the software utilises the unique antenna design to automatically adjust the radio elements to avoiding interference and optimise performance. Wuellner expects most people will be able to set up OnHub in a few minutes. You can even prioritise a device so that your most important activity, say streaming a favourite show, gets the fastest speed.

In addition OnHub adapts to the evolving needs of its owner because this smart software is regularly updated to unlock new features and deliver new services.

It's a similar concept to the automatic software upgrades Google provides for its Chrome browser or its Chrome operating system running on all those Chromebook PCs. And to support whatever the future might bring there's an impressive 4GB of internal storage space. Most importantly the router is designed to be managed via a brand new mobile app called Google On.

The On App

As we've seen OnHub is no ordinary wireless router. Yet it's the Google On app that simplifies the whole user experience. Available for Apple iOS and Android the app borrows a few tricks from Google's popular Chromecast dongles.

Start the Google On app on a smartphone or tablet and it'll instantly pair with OnHub, using sound as part of the process (the OnHub has a built-in speaker that emits a special pairing tone). The app then walks you through the network setup process. After selecting a username and password, the app offers a simple way to securely send the password key to family or friends; other app settings allow the user to define what data is to be shared.

When the top is glowing green, everything is fine. While an orange glow means you should consult the app to find out what's going on.

Weave Language

Weave was introduced at Google I/O, its annual developer event held back in late-May 2015. It's a cross-platform language that lets devices talk to each other, both directly and via the cloud. The syntax is based around a common command handling concept. So, for example, an 'unlock' command that opens your digital door lock could unlock any number of other smart devices if applied to them.

Google will introduce a Weave certification program to ensure all compatible devices will be able to talk to each other. In addition you'll be able to communicate with devices through voice commands. As Google's Sundar Pichai said at the event, "We hope we can connect devices in a seamless and intuitive way."

Weave is design to complement Brillo, a brand new operating system Google hopes will be installed on millions of small, display-less and keyboard-less internet-of-things (IoT) devices.

The app does more than just router setup, however. You can spot-check a network, prioritise a connected device (say one that's currently streaming video) and troubleshoot a connection – and none of these operations require technical knowledge you would need if you were working with a conventional router.

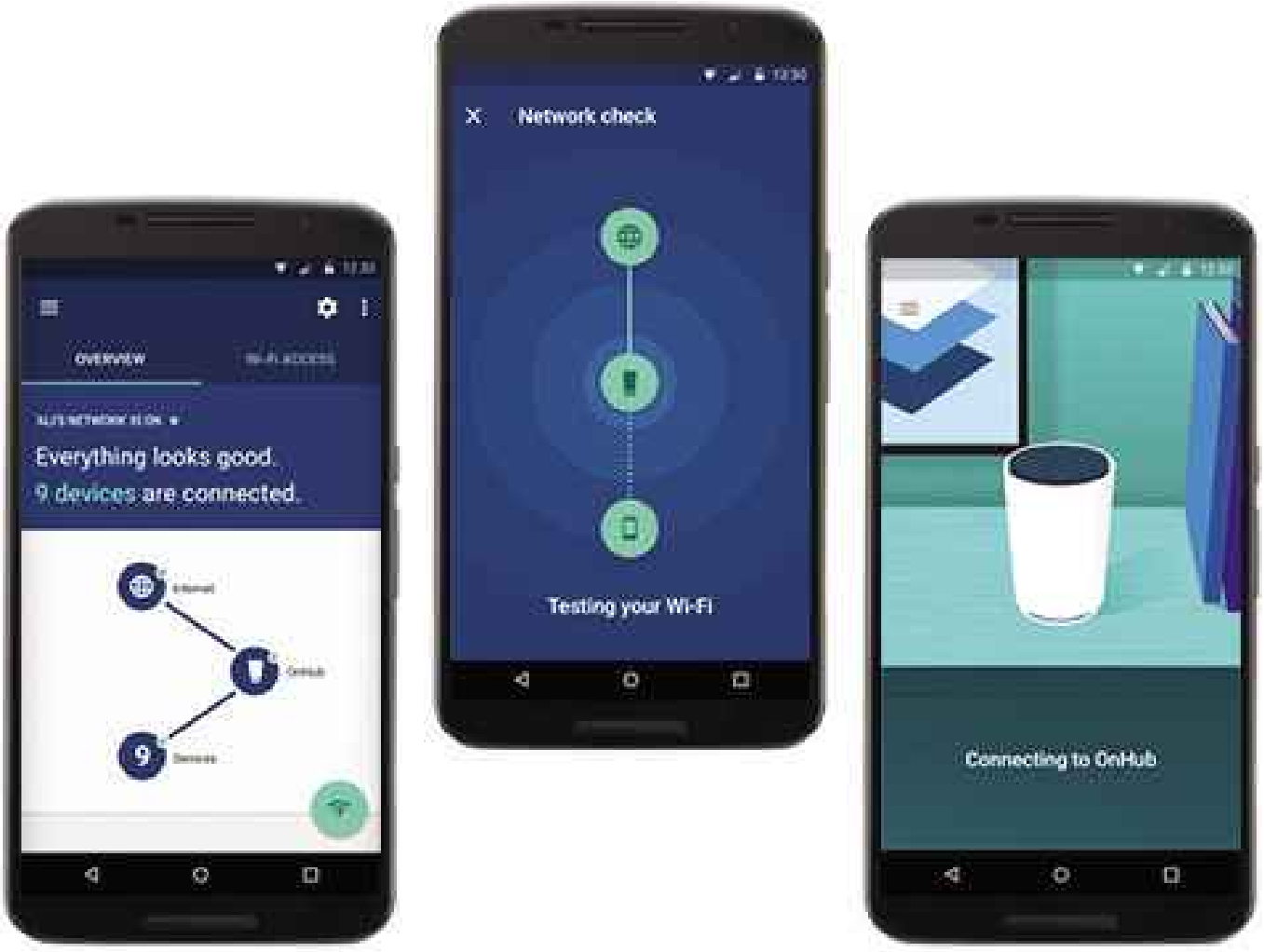
While we talk of routers, it's worthy of note that the device is called the OnHub and not a router. Similarly, the app is called On, rather than something like 'Router Management App'. The reason for these open-ended names is that Google has intentionally left itself plenty of room for future expansion. Not just to enhance OnHub capabilities but to handle other devices as well.

> **"One of the most striking things about OnHub is the way it looks"**

The bigger plan is to deliver a Google-branded gateway to the inter-connected world that bridges the gap between PCs, tablets, smartphones, wearables and a host of smart home-centric devices and appliances. To help deliver this grand plan, under the covers the OnHub uses Google's new Weave language (see boxout). Another of the big announcements from Google's I/O 2015 event, this language is designed to help appliances and connected-home devices talk to each other and integrate. Examples of devices it is intended for include intelligent thermostats, smart lightbulbs, digital door locks and so on.

Data Privacy

However, for some, Google's expansion into wireless routers may ring alarm bells. They remember previous well-publicised privacy incidents. For example how, in 2008, Google started to collect data from wi-fi networks in homes and businesses around the world; a situation that lasted for over two years. And the 2010 acknowledgement that its digital mapping vehicles had been intercepting emails, passwords and other sensitive information sent over unprotected wi-fi networks.



Google On

As a result of this so called 'Wi-Spy' affair Google payed out $7 million in 2013 to settle allegations of illegal eavesdropping in the US. Obviously it would be all too easy for Google to capture OnHub data or ensure it works better for Google services than for others; say YouTube rather than Netflix. However, Wuellner promised none of this is happening when he said, "We're actually really proud of the work we've done around making sure OnHub is a trustworthy and secure member of your family." Wuellner went on to say, "We've drawn a very strong, hard and fast line around inspecting any information or websites about the content you're looking at in your home."

> **"Google has a financial incentive for making the Internet more accessible and less frustrating"**

What's more, as we mentioned earlier, there are app settings that give OnHub owners control of data sharing. This is another indication that Google is keen to repair the bad reputation gained through its previous faux pars by putting users in control of data privacy.

Google still stores personal information sent over the Internet via OnHub when its related to its search engine or other services such as GMail (depending on related user-set privacy control settings within the service). But, of course, this is what happens regardless of the router you're using.

The New Alphabet

In August Google co-founder Larry Page surprised everyone when he announced the formation of Alphabet (**abc.xyz**). What's the reasoning behind this move? Well, as Google pushes further away from its search and advertising fields it's led to frustration among investors who believe the company is spending far too much of its revenue on these high risk ventures. Therefore, this new company encompasses all of Google's diverse activity streams and side projects.

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Nest thermostat

For example Google is now just an Alphabet division – albeit an immensely large, important and profitable one. Nest, the Google acquired smart thermostat company, is another division.Just how many divisions there will ultimately be, and what they'll focus on, is unclear. Innovations like its smart textile technology Project Jaquard (**goo.gl/QmGQHW**) and the secretive augmented reality project Magic Leap (magicleap.com) are two division candidates.

Google has a financial incentive for making the Internet more accessible and less frustrating. Simpler access means more people will run to its world-dominant search engine, as well as YouTube and Gmail. It hopes OnHub owners will spend more time online interacting with a Google services and clicking on those profit-making ads.

> **"Under the covers the OnHub uses Google's new Weave language"**

Reliable wi-fi is important to Google for other reasons. It wants to sell more home appliances and other equipment that require wireless connections to the Internet. For instance the new Nest division already sells thermostats, smoke detectors and video cameras (see boxout) that are utterly dependent on wi-fi access. Further supplementing this vision is Google Fiber, an ultra-fast Internet service that will soon, we're assured, be available in more than 20 US cities. The firm is even building balloons that fly around the world beaming connectivity down to Earth. In a separate move, Google is also preparing to offer Android smartphone subscriptions plans.

These, and many others, are all candidates for Alphabet divisions. Indeed, the OnHub Router could well find itself in one of these new companies-within-a-company; maybe something like the Nest division, perhaps?

Product Availability

The TP-Link manufactured OnHub went on sale for $199 in stores in the U.S. and Canada during late August and early September. It's also available from Google's own online store and other large online stores like Amazon.com (**goo.gl/HTfHkA**) and Walmart.com (**goo.gl/WLENrp**).

Nest

Google acquired Nest (**goo.gl/vxxTBy**) in January 2014, much to the surprise of its investors. At the time it seemed like a strange decision, but today the pieces are falling into place.

Nest (**nest.com/uk**) captured Google's attention with its smart thermostat product (**goo.gl/YlY7Q7**), which learns then imitates your heating settings behaviour. It's also controllable from an smartphone. Since then, helped by generous Google funding, Nest has expanded its range.

The smart smoke/CO alarm (**goo.gl/Kng66g**) embodies an industrial-grade smoke sensor and carbon monoxide detector, but one that speaks with a human voice, automatically tests itself and lasts up to a decade. If the alarm identifies a problem your smartphone will receive an immediate alert, which identifies which part of the building is being effected and offers advice based on the nature of the problem. And you can silence the alarm directly from your smartphone.

With the Nest Cam (**goo.gl/mGcVvC**) you can monitor your home from a smartphone, wherever you happen to be. Features include secure HD 1080p video streaming, advanced night vision, motion alerts and a 130° wide-angle view; although you can also zoom into areas of interest. Apart from a free-standing setup the Nest Cam can be mounted either magnetically, to a wall or by using a tripod.

All of these different products are designed to integrate with a single Nest app.

At the time of writing the OnHub availability picture for Europe and the rest of the world isn't at all clear, though. Google does appear to have a similar Asus-made router in the works at the moment, which has led many to speculate that this could be the model intended for European and Asian marketplaces? It is possible this could even come with a different specification. Say some extra ports, perhaps? There has been no formal announcement from the company, though.

The Competition

As we've seen OnHub represents the latest phase in Google's mission to make it easier for people to get online. It's a key part of Google's plan to lower the cost and accelerate the speed of Internet connections.

While it's significantly more advanced than pretty much any other router, the OnHub's home-centric design puts it in direct competition with the Amazon Echo (**goo.gl/aQ6Zhq**), which is also vying to be your connect-everything-to-me router. Surprisingly, Apple's Airport Extreme (**apple.com/uk/airport-extreme**) isn't much competition for the OnHub in terms of being visually attractive, but there's no doubt Apple is keen to take control of your household wireless connectivity needs in the same way Google is, especially now it has the Apple Watch in its product lineup and a soon-to-be-released range of health technology it's developed via the Apple-IBM partnership.

The sudden appearance of OnHub may drive new updates of these routers, however, or spur manufacturers like HP to create more advanced devices; Microsoft may even decide to enter the party. As is often the case when Google enters a market, all of a sudden the wireless router world looks much more interesting. **mm**

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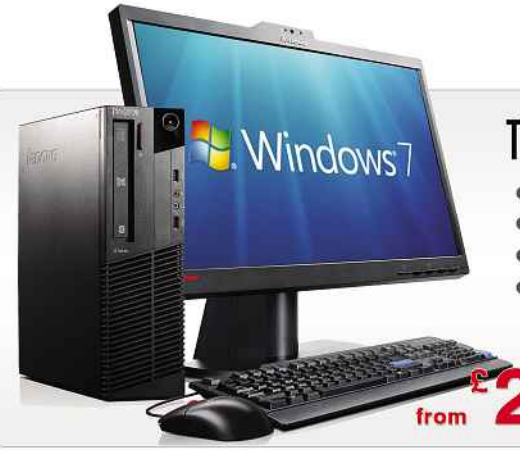

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The Silent

Mark Pickavance looks at Twitter's recent efforts to disconnect users who hold politicians to their word

Watching our political representatives being interviewed is often like watching a small child try to eat peas using only a knife – because even if there isn't anything especially challenging about the questions they're often given, they've been pre-programmed not to give a direct or definitive answer.

Our frustration with these activities is best presented by the infamous Paxman versus Howard clash, where he asked the same simple question no less than 12 times and still failed to get an answer.

These days, however, the political class aren't just being evasive on Newsnight; they're trying not to say anything concrete on social media too.

Understanding Twitter

Before we go off on an adventure in revisionist history, it's first good to understand how Twitter works, for those who probably made the right choice to stay off it.

When someone tweets, those who subscribe to that person will see what they say, and also you can get access to that statement if someone else retweets it or if it's aggregated in some other way.

Should they suddenly regret what they said, they can delete the tweet, after which it isn't visible or part of your Twitter history. Here are the rules according to Twitter about deleted tweets:

- When you delete a tweet, it is removed from your account, the timeline of any accounts you follow and also Twitter search results.
- Retweets of the deleted tweet will also be deleted.
- If other users have quoted your tweet (i.e. copied and pasted part or all of your text into their own tweet), their tweets will not be removed.
- If other users have retweeted your tweet with a comment of their own, their tweets will not be removed.
- Tweets may be cached or cross-posted on third-party websites, applications or search engines. We cannot remove tweets that are not on Twitter.

What's interesting about these points is that while you can remove a tweet and by definition all retweets, you can't get rid of any augmented tweet, critically.

Based on these ground rules, Twitter isn't like SMS messages, which can't be undone, although equally once they've been seen by others they can't be unseen either. Or rather, that's what most normal people might think.

It became apparent about two months ago that Twitter thinks in a totally different way, where you can travel back in time and fix whatever mistakes you've made, even if you're a political figure or public servant.

Politwoops

For those not in this loop, and I include myself in that statement, Politwoops is a service built around tracking the tweets of public representatives around the world. So when, for example, some aging misogynist with a comb-over running for president tweets something appalling, it makes a record of that. And should they then be advised that calling the populous of a nearby nation 'rapists', before subsequently deleting that tweet, there's a record that it really happened.

That's useful, because the number of times that people with political power (or looking for it) say things and then deny them subsequently is legion.

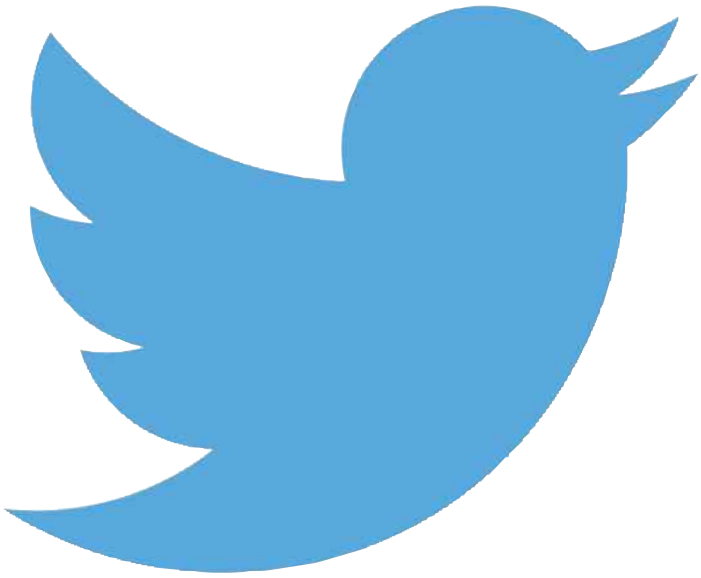
Or rather, we might think it's useful to hold people to their public statements, but Twitter doesn't.

> **"The number of times that people with political power (or looking for it) say things and then deny them subsequently is legion"**

To do this job efficiently, Politwoops had access to Twitter's API, and Twitter decided that Sunlight Foundation, which owns the site, had broken its rules. "Your service violates our API Terms of Service on a fundamental level."

This confused the Sunlight Foundation, because it had been running this service since 2012, and it hasn't done anything different with Twitter for the past three years.

In a statement (not subsequently deleted), it said, "We are truly mystified as to what prompted the change of heart, and it's deeply disappointing to see Twitter kill a project they had supported since 2012. It is also disturbing to us that our feed was cut almost three weeks ago and our only direct communication came from Twitter last night, when we were told that their decision was not something that we could appeal and, most surprisingly, they were not interested in reviewing any of the email conversation from 2012. Clearly, something changed – and we're not likely to ever know what it was."



Donald Trump in full flood on the subject of those he doesn't like (mostly Mexicans). He's one of those exceptional political figures where people wish he'd delete all his tweets, regardless of whether they're inflammatory or not.

A recent tirade against Fox News anchor Megyn Kelly was a new low point in his relationship with Twitter. His output there was described by one commentator as being "as unacceptable as it is disturbing".

It's not just American politicians who get into trouble with Twitter; ours do too. David Ward, a Yorkshire Liberal Democrat, got into deep water when he tweeted the following on the subject of the situation in the Israeli occupied territories: "The big question is – if I lived in Gaza would I fire a rocket? – probably yes."

After being rightly slammed by his own and other parties, he said his comments were "misinterpreted" in a way that he clearly hadn't anticipated.

After some initial bullishness, he later released a statement condemning the actions of Hamas in Palestine, reiterating that his comments were "not in support of firing rockets into Israel. If they gave the opposite impression, I apologise."

This understandably caused something of a storm, but Twitter was unrepentant.

"Earlier today we spoke to the Sunlight Foundation, to tell them we will not restore Twitter API access for their Politwoops site. We strongly support Sunlight's mission of increasing transparency in politics and using civic tech and open data to hold government accountable to constituents, but preserving deleted tweets violates our developer agreement. Honoring the expectation of user privacy for all accounts is a priority for us, whether the user is anonymous or a member of Congress."

Quite what was done to annoy Twitter at this time remained a mystery, but then other similar operations had their access yanked since.

Global actions

Outside the USA, copies of Politwoops are operated in 30 countries by the Open State Foundation, and there is another similar service called Diplotwoops that follows diplomats and embassy staff.

At the end of August, all these also had their API access by Twitter removed, all because their audacity in displaying deleted tweets.

As was pointed out to Twitter at the time, in most countries including this one, what a politician says in public is a matter of public record. Yet this concept seemed entirely lost on the company, which issued what can only be described as the sort of thing people tweet from the pub and then regret later.

"Imagine how nerve-racking – terrifying, even – tweeting would be if it was immutable and irrevocable? No one user is more deserving of that ability than another. Indeed, deleting a tweet is an expression of the user's voice."

> **"Appearing to side with those who won't get behind things they've said in public is a regrettable position"**

Eh? Well, in this and most other countries, when an MP goes on TV, it's recorded, and if he says something stupid, he can apologise later, but he can't make the TV company delete the recording.

That might well be 'terrifying' to those who find their inner monologue has gone wonky, but that's life.

At this time, presenting deleted tweets is apparently no longer acceptable, even if it flies in the face of common sense and logic.

Hardly a day goes by without the nightly TV news featuring a political story in which Twitter has played a part, and in which the statement made has 'since been deleted'. As Twitter's delete function doesn't extend to deleting that TV piece or removing it from the brains of those who read it, this seems an entirely pointless exercise.

Some people might see this as a parallel discussion to the one surrounding the right to be forgotten and the less than satisfactory way that this could be used to hide past misdeeds with very current implications.

But by definition, tweeting isn't something that people have done to them; it's something they do to themselves and therefore something they should take some responsibility for.

Republican congressman Jeff Miller was any early scalp for Politwoops. He tweeted several regrettable statements questioning the validity of President Barack Obama's right to US citizenship and therefore by association to be president. Unable to entirely erase these comments, he eventually deleted his entire Twitter account to avoid further backlash from the vitriol of the American voting public.

What's This All About?

Surely, this isn't about privacy, is it, because in the real world, why would anyone go on Twitter if all they wanted was anonymity? It's a pathetic excuse and one that seems cooked up to support the exercising of control over others outside the business.

The last statement made by the company highlights just how little it's thought about this, because surely if deleting a tweet is 'an expression of the user's voice', so is highlighting that you said something that you regretted enough to delete an expression by someone else. Why doesn't that get protection too?

If I were the Sunlight Foundation, I'd write a simple routine that whenever a political figure tweets something, they repost it with an edit, adding 'Seen by Sunlight' to the end of it. Then when it's deleted, because retweets with edits aren't deleted, they won't be expunged from history.

The idea that somehow Twitter can usher in some sort of revisionist nirvana for politicians where they can rewrite their pasts is as silly as its excuses for doing this. What it's likely to do is to inspire people to use Twitter clients to achieve the same objectives without the API, and there won't be any practical way to shut that barn door.

Whatever Twitter's reasoning for removing API access (and it certainly isn't privacy), it's also a salutary lesson in the use of proprietary tools to do important jobs and how those that control them aren't always working in the public interest.

Twitter is a business aiming to make a profit for its stockholders – not a public non-profit service. But equally, it's also one operating in a social media ecosystem that can drop a favoured app as rapidly as it can pick it up, should the wind change direction.

Appearing to side with those who won't get behind things they've said in public is a regrettable position to take and entirely ignores the position of trust that publicly paid senior officials are put in.

If those who say things they subsequently regret don't like the idea, then perhaps they should not use Twitter and avoid delivering the wrong message so effectively.

And if Twitter seems intent on persuing this direction, it might rapidly discover what happens to companies that are deemed no longer relevant on the internet. **mm**

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Remembering...
Casio Databank CD-40

We look at an 80s smartwatch this week

Before we had all these smartphones, tablets, and smartwatches, normal folk went about their business blissfully unaware of what someone else had for breakfast, what old acquaintances and ex-school friends did the night before, or the140-character ramblings of some semi-celebrity. To tell the time, they glanced up at the position of the sun (okay, maybe not), or they looked at the simple dial on their wrists. To contact someone, they used these strange red boxes that appeared on street corners, and required a ten pence piece to work.

Time moves on, though, which is quite an appropriate turn of phrase, as we're going to look at what could be the world's first 'smart' watch for our generation: the Casio Databank CD-40 calculator digital watch. Considering they first appeared in the 70s the calculator watch was an amazing innovation, but it wasn't really until the mid-eighties that they became a household item, and the top of many people's Christmas lists. Marty McFly had one on his wrist in Back to the Future, and Sting wore on the cover of The Police album, *Wrapped Around your Finger*.

Although neither of those examples was this Databank CD-40 model, it shows the ever changing world of technology at the time, and its effect on a generation of youths.

Its History

The very first calculator watch was apparently the work of Pulsar and appeared in 1975. It was a special edition model at first, available in 18kt solid gold and sold for the modest sum of $4000. It proved to be so popular that Pulsar set to work the following year with a more affordable stainless steel version that sold for a mere $500.

Due to the popularity of the technology, other watch manufacturers wanted in on the action. Casio entered the market with CFX-200, a surprisingly capable watch that could handle scientific calculations, as well offering an alarm, backlight and stop-watch. Unfortunately, a UK price of £200 put a lot of people off, despite the lure of the calculator function. The CD-40 was Casio's attempts to make something a little more affordable for the masses; it lacked the calculating powers of the former model, but it only cost around £30, and came with an alarm, backlight, stop-watch, and basic data storage functionality.

Did You Know?

- One of the last models of Casio digital watches from the 80s was the TM-100, which could transmit sound to FM bands 87.5 to 108MHz.
- The first game model was the Casio GM-10, with a side-scrolling *Space Invaders*-type game.
- The CD-40 was a 24-button watch with a 20-time zone, date and time memory function.
- 10 sets of four letters and 12 numbers could be stored, and the calendar function was programmed up to the year 2099. Talk about forward thinking.

It would prove to be the most popular of the Databank line despite the success of the CL-30, DBC-62, CD-401 and the swish CA-901 – which also had a weird little game built-in to it. Sadly, the calculator watch phenomenon didn't last all that long into the 90s. By then, great hulking dials were back in fashion and the world was beginning to move into an altogether more modern age driven by mobile communications.

The Good

A watch and a calculator! You could get away with cheating in Maths tests providing the you kept your wrist out of sight of the teacher!

The Bad

Battery life took a beating when you used the calculator, stop watch, alarm and backlight. Which was quite often, as you liked to show it off to whoever took an interest in it. Otherwise, what was the point of having the coolest watch around?

Conclusion

The modern smartwatch may think it's the first to bridge the gap between telling the time and doing something else, but it's not. Sorry smartwatches, but we had multi-function wrist-worn devices as far back as the 70s.

The Casio Databank CD-40 calculator watch. Very 'smart', indeed

Buttons! Do you remember a time before touchscreens, we used buttons!

It was a glorious device, and a must have gadget of the time

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Component Watch

Component Watch

In the market for 1TB of USB 3.0-accessible storage? Step right up!

1TB hard drives are currently so cheap that it won't be long before they drop off the end of the market entirely. That means, of course, that if you're a bit of a bargain hunter you can grab them at unbelievable prices right now. To prove it, we're using this week's Component Watch to take a look at 1TB portable drives that you can pick up for £50 or less. Honestly, they're practically giving them away!

Deal 1: Samsung M3 1TB
RRP: £57 / Deal Price: £40

Available in a variety of sizes, the Samsung M3 drives are excellent quality with a robust casing and stylish design. We've waxed lyrical about them in these very pages before, and the 1TB is the best value of the lot right now – at just forty quid. As external drives go, it's about as basic as they come, however; the only feature is a USB cable to connect it to your system, which also powers the unit. It is USB 3.0, though, which means you get some super-fast transfer speeds when reading and writing to the drive, but other than that it's as plain as can be. Lucky it's so good at what it does, really, but if simplicity and efficiency are your things, this £17 off RRP price means that it is a great deal.
Where to get it: MyMemory (**bit.ly/1UDP0Mw**)

Deal 2: HGST Touro Mobile MX3 1TB
RRP: £50 / Deal Price: £45

The HGST Touro Mobile MX3 provides 1TB of portable storage for an very reasonable price; a deal that would look a whole lot more attractive if we hadn't just looked at that deal on the Samsung M3. However, you can store photos, movies, music and documents on this secure and stylish external hard drive just as you'd expect, and it too offers plug and play simplicity alongside USB 3.0 support, meaning it's easy to handle, fast to use and there's no need for a separate power supply. A two-year warranty thrown into the bargain only sweetens the deal by adding extra assurances.
Where to get it: Maplin (**bit.ly/1JWUlda**)

Deal 3: Seagate Backup Plus 1TB
RRP: £70 / Deal Price: £47

Seagate is a name with strong credentials in the hard drive world, and this drive shows why it's successful. Available in four colours, the unit is under 5" long, and weighs only 225g. Seagate's proprietary USM module means that the same drive can be connected to USB 3.0, Thunderbolt and FireWire connectors if you buy additional adaptors, although it only comes with USB 3.0 as standard.
Where to get it: Currys (**bit.ly/1Q3jtYE**)

Deal 4: Western Digital My Passport Slim 1TB
RRP: £78.50 / Deal Price: £48

There are plenty of decent, cheap external hard drives, but few have qualities that make them specifically good for portable use. One that does is the Western Digital My Passport Slim, a USB 3.0-powered device capable of storing 1TB, but with an ultra-thin form factor that allows it to be carried around with greater ease. There's even a pouch included so that you don't scratch the case!
Where to get it: John Lewis (**bit.ly/1ifQlDp**)

Deal 5: Verbatim Store 'n' Go 1TB
RRP: £65 / Deal Price: £50

The Verbatim Store 'n' Go is available in colours to suit any taste, including bad: bright orange or metallic pink, anyone? It's also pretty good at its job, though. With simple design and simple operation, a single USB 3.0 port both powers the unit and transfers data; it's also one of the lightest drives we've seen, a definite selling point if you're on the move. What's more, an extra energy-saving "green" button, powers down the drive when it's idling. Not bad!
Where to get it: CCL Online (**bit.ly/1lNDgLr**)

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AMD RADEON GRAPHICS

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NEWS AND VIEWS

Intel Launches Skylake

Robot Vacuum Connects To Smartphone

Nice

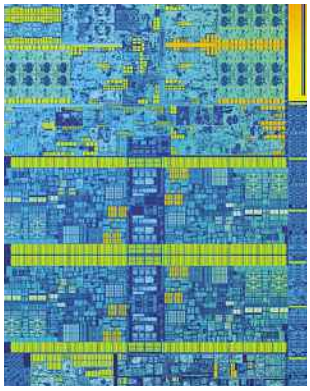
Look, we wouldn't usually cover this kind of thing, but in this smart-home world in which we live, perhaps it's no longer out of place on these pages to mention a robotic vacuum cleaner. Whatever the editorial rights and wrongs, we simply had to share with you one of the finest, unintentionally outmoded and sexist press releases we've read for a while.

"Picture this: if you're having a hectic day at work and your mother-in-law tells you she will be popping by at the last minute and is on the way to your house..." says Avril Murphy, vice president of sales and marketing (EMEA) for Neato. "You simply grab your smartphone, access the Neato app and with a couple of taps your Neato robot immediately starts cleaning."

Well, quite. Of course, without the threat of the mother-in-law, we'd all live in homes of squalor, our lives briefly lifted by the promise of a *Benny Hill*-style caper in the village. As for the product itself, the wi-fi enabled Neato Botvac can be operated directly from an Apple or Android smartphpone via an easy-to-use mobile app to start, stop, schedule and monitor the vacuuming run, with laser-guided navigation leading the fella around the room. It may cost £549 (wowsers) but, as gadgets go, this could be a winner.

QUICK BITS... **According to Juniper Research, Apple Pay will drive mobile wallets using contactless technology to 200**

Sixth-gen range promises better everything



And so Intel has revealed the sixth-generation of its Core family of processors, codenamed Skylake. The range will cater for "the broadest range of device designs", from high-end gaming to smartphones and the new microarchitecture on board means better performance and graphics, alongside improved battery life. That's all according to Intel, anyway. Optimised to handle 4K images and designed for use with Windows 10, Intel is looking to the future with this.

Expect Skylake to start to find its way into an increasing amount of manufacturers' systems now that Intel has announced it.

HyperX Adds To FURY Line

High-performance kits added to line

Kingston's HyperX division has expanded its FURY line of memory kits by throwing in DDR3L high-performance, low-voltage DIMMs. The firm has also launched brand-new HyperX Impact DDR4 SO-DIMMS.

Dealing with FURY DDR3L first, this runs at 1.35V, which is pretty low and means less power consumption and less heat. Available in 1600MHz and 1866MHz frequencies, the plug-and-play modules come in 8GB or 16GB dual-channel kits of two as well as 4GB and 8GB modules. The modules also feature a nifty asymmetrical heatspreader in black with black PCB, which looks pretty nice in your system too.

As for the SO-DIMM HyperX Impact DDR4 (pictured here) that makes for a decent high-performance upgrade for notebooks, small form-factor systems, mini PCs, All-in-One PCs and Steam Machines and it comes in frequencies from 2133MHz to 2666MHz in 8GB and 16GB dual-channel kits of 2 and in 4GB and 8GB single modules.

As always, **www.hyperxgaming.com** is the place you should head to for more details.

million by the end of next year

Malware is never a nice thing to have on your computer, smartphone or tablet. However, ransomware takes things to a whole new unsavoury level, because it's so immoral and utterly brazen.

Recently, news sources have been reporting on the Android app Adult Player, which promised users porn but instead took photos of them and then blackmailed them, based on the notion that men (and I'm guessing it will mostly be men) looking at pictures of naked ladies is somehow a new and shocking phenomenon. In all seriousness, though, in spite of how common porn viewing might or might not be, the fact is people could not only be embarrassed by these pictures (which probably aren't very flattering, to say the least), it could possibly even cost them their jobs or relationships.

Whatever your feelings about adult material, no one deserves this, so the sooner those behind Adult Player are found and prosecuted, the better.

Until next time,

Anthony

Editor

Meanwhile... On The Internet...

Of course, the biggest online buzz last week was generated by Apple's 'Event', which got infinitely more tweets and posts than many would feel its incremental product updates and bigger iPad warranted. Apparently, though, new Apple kit no longer equals unequivocal success (**tinyurl.com/MMnet80a**), a new reality evidenced by the firm's lower stock rating (**tinyurl.com/MMnet80b**), which only rallied slightly following the launch of the new iPad, iPhone models and Apple TV update.

It would seem that, following the cool reception to Apple Music, and sales numbers for the Apple Watch that appaear lower than many people expected, the internet's love affair with the firm is on the wane. Tim Cook certainly has no chance of replicating the cult of personality that surrounded Steve Jobs when he took to the stage to shift units; a cult that will be back in the spotlight as Danny Boyle's film about the firm's former founder, chairman and CEO begins to hit cinemas in mid-October (**tinyurl.com/MMnet80c**).

We were quite keen to give it a look-see anyway, but the approval of Michael Fassbender's performance from Woz sealed the deal as far as we're concerned (**tinyurl.com/MMnet80d**). Plus, y'know, it's still a while until *Star Wars*, isn't it?

Taxi middle-man Uber has had it's problems this week. Not only did its CEO, Travis Kalanick, get heckled by a protestor (angry at how they felt the firm was "ruining" the iconic New York taxi trade) during his prestigious appearance on the first week of Stephen Colbert's new-look *Late Show* (**tinyurl.com/MMnet80e**), it lost a high-profile court case on the other side of the country as well.

In a decision that challenges the foundation of Uber's business model, an appeals board in California has ruled that it must consider its drivers to be employees, rather than independent contractors (**tinyurl.com/MMnet80f**). It's the latest in a series of rulings that have challenged Uber's arms-length relationship with its drivers, a way of working that has thrown up a host of questions about ethics and accountability over the past few years, both into terms of how the drivers are treated by the firm (**tinyurl.com/MMnet80g**) and who is responsible when their drivers mistreat passengers (**tinyurl.com/MMnet80h**).

While the decision itself is not binding across America, let alone beyond its shores, it's believed that it could have a significant influence on how courts and appeals panels across that country will handle the ever growing list of similar legal proceedings. If that's the case, it could have a severe knock-on effect for the company worldwide.

When you consider the caricature of a hipster (**tinyurl.com/MMnet80l**), a perceived sub-set of youth culture that the online world seems so obsessed with these days, the phrase "I liked them before they were cool" (**tinyurl.com/MMnet80m**) is as close to a motto as a clique far too meta and knowing to use mottos would ever get. Now, though, we can all indulge our inner hipster (or expose ourselves as the musical luddites we actually are) by checking in on Spotify's Found Them First feature (**tinyurl.com/MMnet80n**), which can provide empirical evidence of your excellent musical taste to all your admiring friends. Or, y'know... not.

It works by analysing your musical choices and working out how many of the artists you streamed went on to more mainstream success (**tinyurl.com/MMnet80o**) after you first listened to them (leading you, no doubt, to immediately denounce them in true hipster style). Unfortunately for us, our penchant for ELO and the more classic side of the rock coin means we've "missed the party" according to the app, which then offered us a playlist of new artists to help bring out our inner cool kid. Indeed, pushing new music over the platform appears to be the whole point here – an admirable aim indeed.

While, in all honesty, we've failed to find any aspect of our life that we deem exciting enough to livestream to the world via Meerkat or Periscope, that's not to say that we haven't become a little fascinated with those who do. One aspect that's consistently annoyed us about the latter of the two, though, is the phenomenon of VVS, or Vertical Video Syndrome, the title given to a long standing bugbear of ours by YouTubers Glove And Boots (**tinyurl.com/MMnet80i**).

So, it's good news that Persicope has introduced support for landscape videos. At the very least, it means that we can see the world in the widescreen aspect our ocular facilities allow – another victory for humans that comes mere weeks after the world shifted on its axis with news that Instagram would no longer be restrict us to sharing square pics and videos (**tinyurl.com/MMnet80j**).

It's not all that's been added to Periscope (**tinyurl.com/MMnet80k**), either, as it comes with a few other changes that Twitter hope will make the platform attractive against a growing list of competitors. All we need to do now is get an sense of what it's actually for... Or maybe we're just to stuck in the idea of privacy and modesty to *really* understand that.

.AVWhy?

Videos For Your Eyes... Not Necessarily For Your Brain

We do very little to hide the fact that we're a little bit geeky about animation around here, so we'll make no apologies for either a) pointing you towards the trailer for the re-release of Brad Bird's *The Iron Giant* (**tinyurl.com/MMnet80p**), or b) making this lovely little interview with Disney maestro Glen Keane our video of the week. Watching him work in virtual reality using HTC's new Vive VR Headset is an absolute joy, and excites us about the possibilities for the technology and the entertainment it could be producing very soon (**tinyurl.com/MMnet80q**).

Caption Competition

This chap is let's face it, we've all been at one time or another, was the subject for our caption competition in issue 1377. You didn't dissappoint.

- **Thomas Turnbull:** "Maybe I should have used the Net."
- **Martin Prince:** "My mates were right when they said Spear Phishing is much easier."
- **Frank Everett:** "I wonder if this simulation includes taste?"
- **ricedg: "**A prat trying to catch a mackerel."
- **EdP**: "Kevin Mitnick even does his phishing pen tests while on holiday."
- **Thomas Turnbull: "**I'm having a whale of a time."
- **Doctor Yorkie:** "He needs to get it inter-net."
- **Ondrive:** "An unconventional phishing attack."
- **Doctor Yorkie:** "Give a person a fish and you feed them for a day, teach them to use the internet and they won't bother you for weeks!"

The winner, however, was Martin Prince, who came up with the IBM referencing "When they said I'd be a big fish at Big Blue, this is not exactly what I had in mind."

That was pretty good, but if reckon you're funnier head over to the 'Other Stuff' section of our forum (**forum.micromart.co.uk**) and say something funny (but not too rude) about the picture below – or email us via **caption@micromart.co.uk**, remembering to ad the issue number to the email title. Ta!

Smart Move From Motorola

More smartwatches from mobile firm

Motorola is ramping up its presence in the Android Wear market with the launch of its second-gen 360 models. The Moto 360 now has a new, refined look – quite a nice one as it happens – and it's one that also be customised with additional bezels, colours, materials and a new double wrap band at your disposal when ordering online.

The fitness-centric Moto 360 Sport (pictured) has built-in GPS for accurate information on your speed, distance and pace, with a heart-rate sensor to track you efforts. It can store and play music, and the new AnyLight hybrid display means that all of that information is also readable at any time of day.

Prices will start at $299, when the watch goes on sale later this month.

Gaming Affects GCSE Grades

University study suggests less is more

According to research from Cambridge University involving over 800 14-year olds, just an extra hour a day of gaming, web or TV can lead to worse GCSE grades. The study, which analysed homework and other habits and how they correlated to GCSE results concluded that the extra hour of 'screen time' amounted to a GCSE results drop of a couple of grades, which seems pretty conclusive. Students spending an extra hour on homework and reading did noticably better than others too, which isn't especially surprising.

Snippets!

Amazon Offline Video

Amazon Prime Instant Video is now offering members the chance to download videos for offline viewing. Subscribers will be able to download certain movies and TV shows to watch when they are without be a web connection for free. Not every piece of content the service streams is covered under this, but quite is, and will be available to download on Apple and Kindle devices.

This is a big development for a service that has steadily been building a name for itself since it launched.

Microsoft's Skype Boost

Skype has been given a facelift by Microsoft for iOS and Android mobiles. Version 6.0 of the VoIP service has a redesigned interface for both platforms, and also a bunch of new features – including enhanced search, to make it easier and faster to find contacts, groups and conversations.

Android users get a floating action button to make it easier to start new conversations while iPad users get the same functionality as iPhone users, so iPad users can share locations, see weblink previews, send large emoticons and more.

Microsoft also said in a blog post that it's working on its Windows 10 Mobile version too.

More Car Hack Recalls

Fiat Chrysler has recalled more than 8,000 of its Jeep car range because of a bug in the vehicle's computer system that allows it to be hacked into and wirelessly controlled by a would-be hacker, with the the latest in the list of vehicles affected being in the 2015 Jeep Renegade model range. This action comes in addition to the 1.4 million vehicles previously recalled for software updates. Alongside this, security experts have also criticised the company for posting customers a USB stick containing the update.

MacBook Air Thieves Accused

Bad lads didn't really cover their tracks very well

Over in America, a legal case in which four chaps worked together to nab a bunch of MacBook Airs has revealed that they weren't all that clever in their attempts to steal and transport around 1,200 computers, with a value of over $1m, headed for nearby high schools.

One of the group, whose task it was to deliver the shipment of devices, reported his delivery truck as being stolen, claiming it happened when he left it in a parking lot overnight.The problem with his ruse was that, when police visited the parking spot in question, there was no evidence of any vehicle actually having been stolen. Then, when surveillance footage showing the allegedly stolen truck taking a strange route that past the home of one of the other people within the accused group appeared, the FBI felt that it had enough evidence on hand to make arrests.

The gang of thieves has since been released on bail according to media reports, but a look at the possible charges the foursome are faced with, seems to hint that a stretch of prison time is on the cards. Quite a long stretch, actually.

Acer's Block Builder

Does desktop maker's new model stack up?

Acer's Revo Build PC has an interesting design, allowing users to customise their own PC by building up various blocks of parts rather than taking on a more traditional build. By allowing potential buyers to just stack bits on top of each other rather than messing around with kits and caboodles, it's quite possible that this could bring PC building to a whole new audience, albeit one that isn't actually all that interested in PC building really.

In terms of the specs, the base unit consisting of 8GB RAM and an Intel Pentium or Celeron processor with integrated Intel HD graphics will cost just £199. On top of that, a 500GB or 1GTB hard drive will need to be paid for, and then other 'blocks' will be released over time, including a Power Bank for wireless charging and Audio and Graphics Blocks to improve sound and images respectively.

On paper, this is an interesting way to shake-up the desktop industry, with one obvious caveat. If you need to buy all of the blocks in order to build anything close to resembling a decent PC experience, this might not prove the success Acer would like it to be. Still, fair play to the company for trying something a bit different.

QUICK BITS... **Toshiba has posted a full-year loss for the year to March of around $318m. Ouch**

Cool For Cats

Water-cooling option now at Overclockers

Watercooling component maker EWKB will soon have its Predator kit in stock over at **www.overclockers.co.uk**. Available in a couple of models – the Predator 240 and Predator 360 – these coolers are pre-filled and pre-assembled so they're ready to attach to your case and processor for extreme cooling. The radiators use EK Vardar fans, offering high static pressure with PWM controls to give a low noise footprint.

Priced from around £140 when they comes on sale at the back end of the month, these units are only currently available for Intel processor sockets (AMD versions are planned for next year). That could be worth waiting for, though, because with a full copper core providing superior heat dissipation and a powerful 6W liquid cooling pump for up to three times higher flow rate, this could be a watercooling winner.

Canon Comes Up With 250m Pixel Sensor

Crikey!

Canon has announced that it's working on a CMOS sensor that holds a mighty 250 million pixels. That's the highest number of pixels ever placed on a CMOS sensor smaller than the size of a 35mm full-frame sensor, the practical capabilities of which include the ability to be able to take snaps of an airplane 18km away that make it possible to distinguish lettering on the side of the plane. Video footage taken using this sensor was at a resolution level around 125 times that of Full HD video and 30 times the resolution of 4K video.

Canon is looking at using this technology in specialist surveillance and crime prevention tools, plus ultra-high-resolution measuring instruments and other industrial equipment. For we mere mortals, this has no practical use but it's an impressive sign of progress nonetheless.

Canon

Samsung Launches UHD Blu-Ray

World's first for South Korean firm

We now have the world's first ever ultra high-definition blu-ray player, displayed in all its glory at IFA. Yes, Samsung's UBS-K8500 player takes the prize for getting there before anyone else and it plays content at four times the resolution of your common blu-ray movie with 10-bit colour to boot.

With support for high-dynamic range via a HDMI 2.0a port, Samsung has also said that this player is going to sell for less than $500 when it's launched next year. If you want some stats with your story, here are a few for you. A dual-layer UHD blu-ray disc supports a bitrate of up to 108Mb/s while triple-layer disks go all the way up to 128Mb/s. Wow.

US Man Arrested Over Drone Flight

Teach gatecrashes tennis tournament

These drones are starting to become a bit of a nuisance, aren't they? The latest incident to reach the media happened at the US Open tennis, when a quadcopter drone crashed into the spectator seating area. Luckily, there was nobody sitting there at the time, but the man responsible – a teacher, no less – was arrested and charged with "reckless operation of a drone", according to local reports.

The drone was flown over during an actual match, but it just so happened that spectators were pretty thin on the ground for that particular court. It sounds like the crash was unintentional and that the teacher just lost control of the drone in question. One of the players was quoted by the Associated Press: "A little bit scary, I have to say. With everything going on in the world... I thought, 'OK, it's over.' That's how things happen."

BenQ EW2750ZL

Boundless views from a virtually frameless monitor

DETAILS
- **Price: £180**
- **Manufacturer: BenQ**
- **Website: goo.gl/HcVVgb**
- **Requirements: HDMI source, DisplayPort or DVI will need an adapter**

One of the main problems we have with the various monitors that we review is the use of a thick bezel around the screen. Too often, manufacturers take great panel technology and then ruin the appeal by using an extraordinarily thick lump of plastic around the edges of the screen. That's not the case here, though.

The main draw of the BenQ EW2750ZL is its near bezel-free sides and top. Not only does it look remarkably stunning, but it fools you into thinking the screen size is bigger than it actually is. Not that there's any small about the 27" IPS VA LED to begin with, and the full HD screen with a dynamic contrast ratio of 20,000,000:1 produces an absolutely brilliant image.

Not only is the bezel thin on the EW2750ZL, but the monitor itself is pretty skinny too

The thin bezel is an excellent selling point

We've decided: we're not giving it back

Being IPS, you get a good viewing angle, and because this is a BenQ model monitor, there comes with it the extra viewing technology of a flicker-free backlight, low blue light modes and better control over the screen, thanks to the BenQ Eye Care features.

Connectivity is good too, with a pair of HDMI ports (one of which is MHL enabled), VGA, line in and a headphone port. There's no DisplayPort or DVI, though, so you'll need some kind of conversion along the way if your setup can't directly cope with the lack of these ports.

Returning to the style and aesthetics of the monitor, the bezel (what little there is of it) around the sides and top of the screen measures just 2mm, with the bottom portion measuring 20mm and displaying the BenQ name and model of the monitor. It's easily one of the thinnest frames we've ever come across, and if you place two of these together in a dual desktop setup, the nearly seamless effect is simply wonderful.

The rear of the EW2750ZL caught is off-guard somewhat, as it's entirely a glossy finish plastic. Naturally, this means it's an instant dust and fingerprint magnet, and we're personally glad that BenQ decided to leave the glossy effect at the rear of the monitor, because shiny black plastic usually doesn't look as good at the front.

The quality of the image displayed is as good as you would expect from an excellent IPS monitor and from a company that excels in producing top-of-the-range screens. It's clear, sharp and immaculate in its display. There's an equally good production of very bright and very dark areas, with the high gamma helping to separate the two to an astonishingly good degree. As we said earlier, the thin surround makes the monitor 'feel' surprisingly bigger than it actually is. An optical illusion it may be, but it's a good one.

Games, films, photo viewing, editing and video editing duties were all excellent, especially the brighter elements, where there's often some graininess from other VA panels, but thankfully not in this case.

The BenQ EW2750ZL is one of the better quality monitors we've tested in recent months. The screen is excellent, and the thin bezel makes for a far more stylish monitor than we're generally used to using. It's also not too badly priced either, at around £180. The only downside is the lack of DisplayPort and DVI. From our point of view though, we're seriously considering not giving this one back to BenQ.

mm David Hayward

A great monitor with a superb screen and ultra-thin bezel

Sony Xperia M4 Aqua On Vodafone

Vodafone offers a Sony Xperia Aqua phone that doesn't cost the earth

DETAILS
- **Price: Free on £22 contract, £125 PAYG**
- **Manufacturer: Sony**
- **Website: shop.vodafone.co.uk**

Phone technology is entering an odd phase currently, where the makers aren't sure which are premium phone features and which should be entry-level ones.

A classic example of this confusion is the Sony Xperia M4 Aqua, supplied in this instance to me by Vodafone.

This device costs £125 on PAYG, or you can have it inclusively if you take a £22-per-month, 24-month contract that nets you 500 monthly minutes, unlimited texts and 500MB of data.

Initially, that seemed like a fantastic deal for me, as the Xperia M4 Aqua on paper seemed to have inherited some of the features from the Z3, a premium priced product.

Being an 'Aqua', it's fully waterproof, and the glass front and back design feels relatively sleek and light to handle. The band between front and back might be plastic, but it's still an attractive looking design that's just 7.3mm thick.

To make it affordable, Sony made a few compromises, the first of which I noticed was the 720p screen. The Z3 has a 1080p panel, but there isn't anything horribly wrong with this one in respect of clarity. It could be brighter, however, because reading it in bright sunlight is a real challenge.

You can work around the screen, but the limited amount of storage Sony gave this phone is more of a problem. It comes with 8GB, but only 2.8GB of that is actually available for the user, with all the utter crapware Sony and Vodafone piled on it.

> "Of the features here, the worst is probably the camera"

Actually, to be fair to Vodafone, it's mostly Sony that doesn't know where the line is in this respect. For those who don't choose to fill the micro-SD slot, there is much to delete to make this a more workable scenario.

The phone comes with Android 5.0 Lollipop and Sony's own UI interface, which I liked more than the ones that LG and Samsung have gone with. It's not too far from the Google baseline, and you can easily switch back to that if you want.

Of the features here, the worst is probably the camera. It's 13MP, but unless you're in super-bright conditions, the contrast and colour representation in images is generally dire. If you like taking photos, just avoid the M4 Aqua.

Sony also claims that the 2400mAh battery will keep this phone going for two days, though I assume that to achieve this you turn the screen brightness down so it's impossible to read anywhere but indoors.

After only a few hours use, I concluded that the Xperia M4 Aqua reminds me much of the HTC Rhyme I reviewed a few years ago, another device that had more style than substance.

This phone looks good and isn't expensive, but there are much better ones available if you can afford a few pounds more.

If you don't ever take photos or play games, then this might be the phone for you, but I'd check out the new Moto G LTE before parting with cash.

mm Mark Pickavance

A cheap waterproof phone undermined by a poor camera and crapware

Ikea Nordmärke Pad And The Riggad Lamp

Mark summons an invisible energy but without using the power of Thor

DETAILS

- **Price: Nordmärke £30, Riggad £49**
- **Manufacturer: Ikea**
- **Website: www.ikea.com/gb/en**
- **Requirements: Qi compatible devices**

I'm not a regular visitor to Ikea, even if it does have a massive warehouse near where I live. As it happens, actually shopping there involves an annoying drive that takes more than an hour and the joy of traversing the dire road system of Milton Keynes.

However, I was there recently, and noticed that it had embraced the world of mobile electronics, combining it with its low-cost Scandinavian furniture.

The Nordmärke ('north brand') is a basic Qi charging pad fashioned from a disc of light pine, and it comes with a 2m cable to connect it to an excessively large socket-mounted power supply.

To charge a phone or compatible tablet, you simply drop the device onto the X symbol at the Nordmärke's centre, and through the mystical powers of magnetic induction, it will eventually become recharged.

My only complaint about this design is that Ikea placed the activity LED under the X pad, where unless you have a remarkably small phone, you'll never see it. Surely placing it somewhere around the edge might have worked so much better?

Other than that obvious mistake, the pad works fine in the context of what Qi charging promises. However, it's worth pointing out (and this is no fault of Ikea) that Qi charging does take longer than plugging a cable in, if you're in a hurry.

If your gizmo isn't Qi capable, then thankfully you're not completely out of luck with this design and its associated accessories.

Phone owners should check with Ikea if it makes a Vitahult ('White Hut') for your phone,a protective wireless charging cover it sells for between £10 and £20.

At this time, it makes these for the Samsung Galaxy S3, S4, S5 and Apple iPhones i4/4S, i5/5S and i6. Those with a Galaxy S6, HTC, Nokia Lumia or LG phone probably won't need one, as these usually have Qi built in.

For older devices that don't support Qi, you can use the standard full-size USB port on the Nordmärke's edge to charge using the a standard phone charging cable.

If you exclusively use that option, then the Nordmärke isn't much use to you, but if you have a couple of items, one of which is Qi chargeable, then it's a better fit.

The only real problem I have with the Nordmärke is the price, which seems at least £10 more than I'd reasonably consider.

You can buy a plastic Qi charger on Amazon for less than a tenner, so this seems rather steep, even if Ikea's option is generally more attractive. For those with lots of QI chargeable items, Ikea also makes a triple-pad version of the Nordmärke, though it wants a whopping £60 for that product.

A variation on the Nordmärke pad is offered with the Riggad ('rigged'), which combines the recharging surface with a nice angle-poise LED lamp. A quick inspection reveals that it uses the same awkward-looking PSU as its little brother, unfortunately.

That said, I liked this product much more for

numerous reasons, mostly that it seemed to be of a higher-quality construction than the Nordmärke. It also has the added advantage that if you end up with a phone that doesn't support Qi, then at least you still have a nice lamp.

Ikea wants £49 for the Riggad, so for just £19 more you get a pleasant lamp and a larger platform for charging your device. This makes it more suitable for a tablet than the Nordmärke, where it's difficult to position correctly when the whole pad is entirely obscured by the tablet.

Like its smaller brother, it also includes the single full-size USB port for wired charging, conveniently. There is room on the Riggard for more ports, but as it uses precisely the same PSU, that might have taken the charger and lamp combination over its power budget.

What I did admire was the rather slick lamp design, having a large pine on/off switch on the top of the bulb housing and a solid heavy base to give it good stability. Of these two products, this is the one I'd prefer in my home.

If neither of these products inspired you, Ikea makes two more lamps and a couple of bedside tables, all with the same charging pad built into them.

And if you're feeling that you want the technology in a totally different piece of furniture, it also makes two kits for £30 that can be installed simply by drilling a hole of the correct diameter. It's not an easily reversible change, but it could make a nice repurposing project for someone.

Overall, both Nordmärke and Riggad could have been cheaper and probably more polished products than they ended up being. However, I'm encouraged that Ikea is taking an interest in wireless charging technology, and I hope other furniture makers follow its lead.

mm Mark Pickavance

Nordmärke: Wireless charging with Scandinavian style

Riggad: A nice wireless charging and angle lamp combo

Zotac GTX 950 AMP! 2GB

Zotac's new GTX 950 offers a unique blend of performance and style

DETAILS

- **Price: £141.99 (Ebuyer)**
- **Manufacturer: Zotac**
- **Website: www.zotac.com**
- **Requirements: PCIe 3.0 x16 Slot, PCIe 6 pin power, Windows XP or later**
- **Part No: ZT-90603-10M**

First impressions are always important, and the ones I got unpacking this video card were great in a way that many other pieces of technology fail to achieve.

Even compared with some very expensive designs, the Zotac GTX 950 AMP! feels like a precisely tooled piece of high technology engineering. Sporting what Zotac has branded as 'Exoarmor', the whole outer shroud of the card is metal, and it's gorgeously finished.

As a more affordable option to the GTX 960, the GTX 950 was always going to be less powerful, but the Zotac GTX950 AMP! answers the critical question about how much – and surprisingly it isn't a huge amount.

Looking at the specifications, this card is built around the same Nvidia GM206 GPU, with exactly the same number of transistors wired to the same amount of GDDR5 on a 128-bit-wide memory pathway.

It's just that some of those transistors are likely to be twiddling their silicon thumbs, because the shader units are down to 768 from 1024, although it still has 32 ROPs.

To differentiate the stock further, the core GPU and memory clocks are also reduced. Or they would be had Zotac made its card use stock settings, but it's an AMP! model, so it's boosted the core to 1203MHz – higher than the GTX 960. And similarly, the GDDR5 memory is operating at 1755MHz, and not the 1653MHz of a standard GTX 950. That delivers a total memory bandwidth of 112.3GB/s – sufficient for very high resolution gaming and even multi-display fun, should you want to do that.

Running *World of Tanks* 9.10 on my Core i5 work rig, the card can easily maintain 50fps at a resolution of 2560 x 1440, with all quality settings at the highest level.

On my Core i7 LGA 2011 testing rig, this card achieved a score of 6,524 using 3DMark Fire Strike – shy of the Zotax GTX 960 AMP! by less than 400 or about 5.5%.

In other tests, the difference was less than 5%, and against a stock GTX 960 those scores would be even closer, if not almost the same.

That's better than the previous generation GTX 760 and at least 10% more than a stock GTX 950. For those wondering if pre-overclocked cards are worth it, the answer is a definitive 'yes' with this design. When a card offers more than a 10% price boost for less than that much of a price hike, then it's worth having.

There are two potential potholes in my path to recommending this card, and the first of those some very cheap R9 285 cards that it's competing with. They're marginally quicker in most tests and cheaper, although conversely they use more power, requiring dual PCIe six-pin power lines.

Another potential problem is DX12 – or rather the odd discrepancy that seems to be developing between AMD and Nvidia regarding which architecture is better for this API. Whereas Nvidia has been ruling the DX11 roost, it appears that might not be the case with the

Benchmark Performance on 3DMark

		Zotac GTX 950 AMP!	VTX3D R9 285
OS		Win 10	Win 10
3DMark Fire Strike	Performance	6524	7329
	Extreme	3308	3626
Sky Diver		21172	22193
Cloud Gate		24754	25459
Ice Storm	Extreme	138572	138885
	Normal	156184	146869

new DX12 API that's in Windows 10. At this point, this is all moot, because there aren't any DX12 games, and there won't be many for some time, but it's a point worth considering.

I should also mention that under some circumstances, mostly prolonged gaming, the card can also get quite noisy. It wasn't like the police helicopter that hovers over my house far too often, but it was noticeable. Once the game action abates, it soon gets quiet again, which probably draws attention to when it isn't totally silent.

When you're using the card for general 2D desktop work, the fans often stop entirely, when the GPU is 60°C or below. Oddly, the card hardly broke 70°C while gaming, so there's some room to lessen the fan RPM without the hardware getting overheated.

Overall, I liked this card for a wide range of reasons, rather than one headline feature.

It takes a single PCIe power line, the fans entirely stop when you're not gaming, and it delivers plenty of video performance for the price and the watts. It's also made to a quality level that pleases me, even if some might accuse it of being over-engineered.

When you combine the performance, power efficiency, cost and the excellent build quality, the Zotac GTX 950 AMP! becomes the pre-overlocked version of this series to want – and a singularly more practical card than some of the high-end designs above it.

mm Mark Pickavance

A video card that runs as good as it looks

Mad Max

Does this game deserve to drive away with our recommendations?

DETAILS
- **Price: £35 (Steam)**
- **Manufacturer: Warner Bros**
- **Website: www.madmaxgame.com**
- **Requirements: 3.4GHz processor, 8GB RAM, 32GB disk space, Nvidia GeForce GTX 760 or AMD Radeon HD 7970, Windows 7 or later**

If you're developing a *Mad Max* game, who do you make your main character look like? That, of course, is a question that Avalanche Studios, the developer behind the simply named *Mad Max* had to answer.

You might think Mel Gibson, as the man who played Max in the original trilogy, would be the logical choice but, let's face it, he's destroyed so many bridges he might as well start his own demolition business. So what about Tom Hardy, who plays Max in the franchise reboot, *Mad Max: Fury Road*? Considering that film came out just a few months ago, it would make sense to base the game's character on Hardy and perhaps even get him in to voice it too.

Interestingly, though, the developer has chosen to take a different route, by introducing an entirely new face to the role (he looks a bit like a maths teacher at my old secondary school, but I'm guessing that's just a coincidence). This might not seem important, but it is, because it signals that Avalanche is giving us something new, rather than just knocking out a low-quality movie tie-in, like far too many developers do.

So, new Max, a new story and a new game. But how does it play? Well, that depends largely on how much you like cars and driving games, because they're very much the focus in *Mad Max*. That, of course, is perfectly fitting considering movie series' unabashed love affair with motor vehicles, but if you're not a fan of driving games, then I wouldn't buy this game.

The main story mission involves Max having his car stolen from him by bandits, leaving him on a mission to find or replace it. As it happens, he meets a mentally deranged and physically deformed but nevertheless skilled mechanic, who offers to build him an even better vehicle: the Magnum Opus.

To succeed, Max needs to find parts, while also taking down enemy bases and defences and doing other side mission-type things. It's pretty straightforward open-world stuff, which anyone who's played, say, an *Arkham Asylum* game will be familiar with. It also feels startlingly similar to *Shadow of Mordor*. (All these games are published by Warner Bros, but they're from different studio and apparently use different engines, so make of that what you will.)

As we said, the key feature of Mad Max is the focus on driving, with Warner Bros itself stating that 60% of the game will see players in a vehicle of some kind. Not only do you have to drive from place to place, you also fight other cars by charging directly into them, and using a harpoon or even shooting a gun to take out them out.

When you do get out of the car, it's normally to run into a base and have a bit of a scrap, as well as to collect various materials (including actual scrap, which is used like currency to buy certain upgrades). The fighting, however, is extremely pared down compared to titles such as *Shadow of Mordor* and *Batman*, which makes sense when you think about the character of Mad Max. He's not a kung-fu master or a superhero; he's an ordinary man, who just happens to be handy with his fists.

As fitting as this is with the character of Max, though, it's also a tad boring and not really much fun to play. Yes, you can buy upgrades and moves for Max, but they're not particularly interesting and generally add little to the experience. Also, as we were exploring, looking for items, we found the camera rarely seemed to stay where we wanted it to, which often made for a frustrating rather than compelling game.

On top of that, the story is practically non-existent and doesn't in any way make you want to keep on playing. That makes it even more important that *Mad Max*'s driving component is successful, and fortunately it does not disappoint in this capacity.

If you're a petrol-head, then, this could well be the game for you. If, however, talk of cars, engines and other such vehicular topics bore you, then you're better off staying away.

mm Anthony Enticknap

Well crafted, but it's not for everyone

Transcend MTS400 M.2 SSD

A new drive with plenty of impressive benchmark numbers

DETAILS
- **Price: ~£90**
- **Manufacturer: Transcend**
- **Website: goo.gl/cQ2If6**
- **Requirements: Windows XP or later, Linux kernel 2.6.31 or later, M.2 connection**

According to many experts, 2015 is the year of the M.2 SSD, and why not? An M.2 SSD represents the best storage technology currently available, with good capacities and blistering performance – all from a stick that weighs no more than 8g and is only around 50mm in length. What's not to like?

We've seen a few M.2 SSDs recently, but now we have the pleasure of testing the latest model from Transcend's MTS range, the MTS400.

This remarkably compact SSD comes in four different capacities: 32GB, 64GB, 128GB and the one we're reviewing here, 256GB. It weighs around 4g and measures just 42 x 22 x 3.5mm.

Using Synchronous MLC NAND flash memory together with Transcend designed firmware and a TS6500 controller (a rebranded SM2246EN), the new MTS range focuses on supporting mobile platforms. The size of the MTS400, the use of Power Shield to help prevent data loss in the case of a sudden power outage, and support for DevSleep that shuts down the SATA interface to help conserve battery life all speak of a product that is designed for the new generation of ultra-thin notebooks, as well as tablets and phones.

Considering its size, it performs remarkably well

In addition to that, the MTS400 supports Intel Smart Response Technology, where you're able to configure the SSD to work as a memory cache between the hard drive and system memory. The advantage of this is greater storage with SSD-like performance, eliminating the bottleneck that is now a traditional spinner.

As a stand-alone SSD, though, it's just as impressive. The 256GB capacity is enough for most system drives, especially in a desktop. When using it with Windows 10 or Linux Mint 17.2, the performance is spectacular, with boot times of less than three or four seconds and an overall system improvement that is quite significant, even when compared to a PC with an older SSD already in place.

Our ATTO benchmark recorded some of the best numbers we've seen from an SSD. The read benchmark at 8192KB was 563MB/s, while the write speed was 328MB/s, both of which are in line with the number stated on the Transcend MTS400 site. The smaller transfer sizes proved to be good too: read speeds for 8KB were 440MB/s, and write at 8KB was 329MB/s.

Benchmarks aside, the MTS400 is a fantastic SSD. It's impossibly small, extremely fast and is ideal as a storage upgrade for a laptop or even as a main system drive on a desktop. We didn't get to test the Intel Smart Response Technology this time, but with the access speeds measured, we imagine it'll perform just as well when used purely as a cache device.

Priced at around £90, the Transcend MTS400 is certainly an SSD worth looking into for your next upgrade or as a replacement drive in a laptop.

mm David Hayward

Features
- Space-saving M.2 form factor (42mm) – ideal for mobile computing devices.
- Supports Power Shield to prevent data loss during a sudden power outage .
- Supports DevSleep mode, which allows devices to completely shut down the SATA interface and conserve battery life, unlike existing partial/slumber states.
- DDR3 DRAM cache.
- Supports S.M.A.R.T., TRIM and NCQ command.
- RoHS compliant.

A superb performing, ultra-small M.2 SSD

GROUP TEST

mSATA Drives

mSATA might be gradually being phased out by the industry to make way for the newer form factors, but that doesn't mean it's gone the way of the dinosaur just yet.

David Hayward has a look at six different makes and models with different capacities, to see which can still hold their own in this ever changing technological world.

Kingston SSDNow 120GB mSATA

DETAILS
- **Price: £50**
- **Manufacturer: Kingston**
- **Website: goo.gl/M1A6Kb**
- **Requirements: SATA-3, SATA-2, SATA I connection, Windows XP or later for included software**

The Kingston SSDNow 120GB mSATA drive is a pretty good deal

Kingston has quite a range of SSDs, mSATAs and M.2 drives in its impressive catalogue. Although the mSATA standard may not be quite as popular as it once was, it's still a healthy business line for the company, falling under the SSD System Builder category.

The mS200 range, which is the mSATA branch of the SSDNow products, comes in a variety of different capacities. From 30GB to 60GB, 120GB, 240GB and 480GB, there's something for everyone.

The 120GB mSATA model number we have here goes by the name SMS200S3/120G and costs in the region of £50. It has an LSI Sandforce 2241 controller, with Toshiba-made 19nm Toggle NAND, designed for shock resistance and low power consumption, along with a data transfer life of around 93TB or an MTTF of 1,000,000 hours – which we think is quite a lot.

The drive supports S.M.A.R.T., Trim and Intel's SRT (Smart Response Technology), whereby you can combine this and a standard hard drive, with the SSD acting more like a fast access cache for the most used programs and data.

To get a measure of the performance of the drive, we used the ever faithful ATTO; it may be looking a little long in the tooth these days, but it gives a good idea as to how well the driver performs with different file sizes.

The 8192KB file transfer recorded a score of 560MB/s read and 534MB/s write. The smaller 4KB file size read benchmark came back with 159MB/s, whereas the write was 255MB/s – both of which are decent numbers. We did notice that the LSI 2241 controller used was the slightly underpowered four-channel version, as opposed to the more common 2281 eight-channel controller. The 2281 would have produced a better throughput result on the benchmark, but according to Kingston it uses far more power, and the idea here was to create a low-powered storage device, hence the 2241 controller.

However, with read and write benchmark scores in the 500s for the bigger file size, there's not much to complain about. Considering this drive will only set you back £50, it's certainly nothing to be too worried over.

In terms of the real-world measurement, our Windows 10 PC booted up to the desktop in around seven seconds. We imagine that if you were to use a Linux distro or even a more customised and streamlined version of Windows, that number could very well be halved.

Overall, we were quite happy with the Kingston SSDNow 120GB mSATA drive. It's quick enough, seems to be designed well enough to avoid data loss, and it's certainly affordable. And since it goes up to 480GB, there's also a decent amount of storage available for both desktop and laptop users.

Transcend MSA370

DETAILS
- **Price: £200**
- **Manufacturer: Transcend**
- **Website: goo.gl/kNozcr**
- **Requirements: mSATA interface, Windows, Linux or Mac compatible**

We recently got to review the Transcend MSA370 independently, and while good on its own, it's difficult to see the benefits without a side by side comparison with other drives of its kind.

The MSA370 comes in several capacities of 16GB, 32GB, 64GB, 128GB, 256GB and the one we're currently reviewing in this instance, a decently sized 512GB 20nm MLC NAND. The Transcend TS6500 controller, which is actually a rebranded Silicon Motion SM2246EN, supports SATA-3 6Gbps, Power Shield, TRIM, NCQ and S.M.A.R.T. commands, as well as Wear Levelling, Intelligent Block Management and the Intel SRT feature.

Transcend rates the MSA370 with a 1.5-million-hour life expectancy – a good 500 thousand more than the Kingston model. Although to most home users the extra 57 years' worth of supposed reliability won't mean a great deal, to the business user it could be the main selling factor – especially if the user is handling mission critical data. To add to that, Transcend has also included hardware-level AES encryption support, which again is quite an important factor for business users.

Using ATTO and with Windows 10 installed, the drive recorded 563MB/s read on the 8192KB test and 487MB/s on the write test with the same file size. The 4KB test saw a read score of 137MB/s and 283MB/s for the write test. Again good numbers, but we were surprised to see a drop in the write performance at 8192KB compared to the Kingston model (which scored 534MB/s). On the other hand, the numbers evened themselves out with the smaller 4KB file size, being the opposite of the Kingston mSATA drive.

Our real-world test had Windows 10 booting in around seven seconds – more or less the same speed as the Kingston drive. If you wanted to be picky, you could record the times to within fractions of a second, but for the sake of our sanity and time, both drives are evenly matched.

The Transcend MSA370 mSATA is very competitively priced for a 512GB drive

It's also quick and has tons of features

The price isn't too bad either: at around £200 the MSA370 is reasonably good value for money, especially considering the speed and the amount of storage you're getting. Whereas the 480GB SSDNow mSATA is valued at around £276, the extra 32GB on this Transcend model for £76 less makes perfect sense.

The Transcend MSA370 is still a pretty good mSATA drive, even when next to other mSATA examples. The 512GB of storage is great, and the speeds aren't too bad either. Of course, it's the extras that may seal the deal, and this Transcend drive certainly has a fair few of those on offer.

Crucial MX200 250GB mSATA

DETAILS
- **Price: £76**
- **Manufacturer: Crucial**
- **Website: goo.gl/nRdYAs**
- **Requirements: mSATA interface, Windows XP or later for Acronis free**

The Crucial MX200 range of SSDs come in the standard 2.5" SSD form, as well as M.2 and this, the mSATA version. Aside from the 2.5" model, which we're led to believe uses a different controller, there's not a lot of difference between the manufacturing processes and benchmark specifications.

The Crucial MX200 mSATA drive we have here is the 250GB model, with the only other model being the 500GB drive. The list of supported features is pretty impressive and includes Dynamic Write Acceleration, RAIN support, Data Defence, Power Loss Protection, Adaptive Thermal Protection and Active Garbage Collection. On top of all that, there's also TRIM, S.M.A.R.T. and ECC support. Plus, Crucial has rated this drive with a million hours' worth of life expectancy. The RAIN (Redundant Array of Independent NAND) feature is of particular interest. As you can imagine, this is similar to a RAID array, but instead it uses the data structure inside a NAND device. In reality, it's more of an enterprise/business type function and has little use for the vast majority of home users. However, it does go to show the power behind the Marvell 88SS9189 controller and the customised Crucial-Micron 16nm MLC NAND technology used in the MX200 range.

Using the 8192KB transfer test in ATTO, we recorded a read speed of 562MB/s, while the write speed proved to be 513MB/s. The large file results were very good indeed, on a par with the Kingston and Transcend models in terms of the data read speeds, give or take a few megabytes per second.

The 4KB tests came back with a rather poor 138MB/s and the write speed was just 116MB/s. This seems to be in line with the M.2 version of the MX200 we've looked at before, with decent higher transfer rates with larger file sizes and lower speeds with the smaller data sizes.

Booting to our Windows 10 desktop took just a tad over eight seconds, which is a second slower than the mSATA drives we've already tested. To be honest, we can live with that.

The positives to look for here are the good read and write speeds with bigger file sizes, the 250GB capacity and the fact that the Crucial MX200 mSATA only costs in the region of £76. If you want to class the extra second boot time as a negative, then fair enough, but it's more likely that the much slower transfer speeds with smaller file sizes could be the deciding factor for some buyers.

Other than that, the Crucial MX200 mSATA is a good drive and will certainly serve you well probably for as long as you'll own the machine it's installed in.

The Crucial MX200 mSATA scores well on the big file size transfers

However, it's not so hot on the smaller size files

Samsung 120GB 850 EVO mSATA

DETAILS
- Price: £56
- Manufacturer: Samsung
- Website: goo.gl/kSZg9w
- Requirements: mSATA interface, Magician software requires Windows XP or later

▲ *The Samsung 850 EVO, with its 3D V-NAND memory*

➤ *It is an impressive mSATA drive, the fastest to boot to Windows 10 in our tests*

The 850 EVO range of SSDs from Samsung has proved to be very popular among enthusiasts and system builders since they were launched late last year. They're the first generation of drives to use the coveted 32-layer 3D V-NAND technology, and when paired with Samsung's own TurboWrite technology, the benchmark results are well beyond the average.

The mSATA range of 850 EVO drives are slowly being replaced by newer M.2 ones, but they're still available and going strong. With capacities starting at 120GB (which we have on test here) and rising to 250GB, 500GB and a whopping 1TB, the popularity of this drive hasn't diminished quite as quickly as the pundits originally expected.

This 120GB EVO uses the Samsung dual-core MGX NAND controller, along with the aforementioned 32-layer TLC 3D V-NAND. Aside from that, you can expect support for TRIM, S.M.A.R.T., Auto Garbage Collection, shock resistance, AES 256-bit encryption and reliability rated to an impressive 1.5 million hours. Interestingly, Samsung has also included a 512MB LPDDR3 SDRAM bank of memory on the drive: quite a large cache for just 120GBs of storage.

With all this talk of 3D V-NAND and bigger than average cache, we expected to see some impressive numbers for our ATTO benchmark. As it happens, it wasn't quite as good as we expected.

The 8192KB read test scored 552MB/s and the same file size write scored 533MB/s. Although both great numbers, they were less than the Kingston mSATA drive of the same capacity.

The 4KB values, though, picked up a bit, with 350MB/s read and 302MB/s write, both of which are the fastest smaller file size transfers we've seen so far – nearly double that of the Crucial mSATA drive.

Our real-world boot test to the Windows 10 desktop rocketed through in a blistering six seconds. We're guessing that the smaller file size speeds helped to achieve that score.

Other than the ATTO benchmark and time the boot, the Samsung 120GB 850 EVO performs as well as the other mSATA drives on test. 120GB is enough for the main system files and perhaps a game or two, but you'll soon need more storage if you're planning on putting this into a gaming laptop or small media centre with lots of apps and so on installed.

It begs the question, then, of whether the Kingston 120GB mSATA model we looked at earlier is a better investment compared to this Samsung mSATA drive. Certainly the Kingston model is cheaper, and its bigger file size speeds are a tad better (by mere megabytes per second, mind you). But the Samsung mSATA does feel a little snappier, and the better speed at smaller file sizes makes a difference for most

home users, plus it only costs around £56.

Either way, it's something to ponder on. For the time being, though, we're quite pleased with the performance and price of the Samsung 120GB 850 EVO mSATA.

Plextor 256GB M6M mSATA

DETAILS
- Price: £104
- Manufacturer: Plextor
- Website: goo.gl/JBF1Yr
- Requirements: mSATA interface, Windows, Linux, Mac compatible

It feels like an age since we've had a Plextor drive in for testing. Last year, the company released a slew of its M6 model drives, covering standard SSD and mSATA. The 256GB M6M in particular is one of the more recent of the M6 drives, although it too is over a year old now.

The Plextor 256GB M6M mSATA uses the same Marvell 88SS9188 as the Crucial MX200 mSATA, but with a Toshiba manufactured 19nm Toggle MLC NAND. Feature support comes in the form of TRIM, S.M.A.R.T., shock resistance, AES 256-bit encryption and low power consumption. The lifespan of the M6M is rated at a decent 1.5 million hours which, like most of the mSATA drives tested, should last you beyond the life of the machine it's installed in.

The Plextor M6M range of mSATA drives come in a variety of different capacities, from 64GB through to 128GB, 256GB and finally 512GB. To go beyond the 512GB mark and into the terabyte realm, you'll need to look to the M.2 and standard SSD forms available from the company.

In terms of the ATTO benchmark performance, the Plextor M6M didn't quite come up to the same standard as the other drives we've tested. The 8192KB file size recorded a read speed of 516MB/s, while the write speed for the same sized file transfer was just 434MB/s. Although the read speeds were over the 500MB/s mark, they're still nearly 40MB/s slower than the previous slowest reader.

▲ *The Plextor M6M is a decent drive*

➤ *It's a little expensive, though, for what you get*

However, the smaller 4K file size proved to be somewhat better than most of the other drives tested, with the exception of the Samsung 850 EVO. The read speed for 4KB was 247MB/s, and the write speed was a very reasonable 214MB/s.

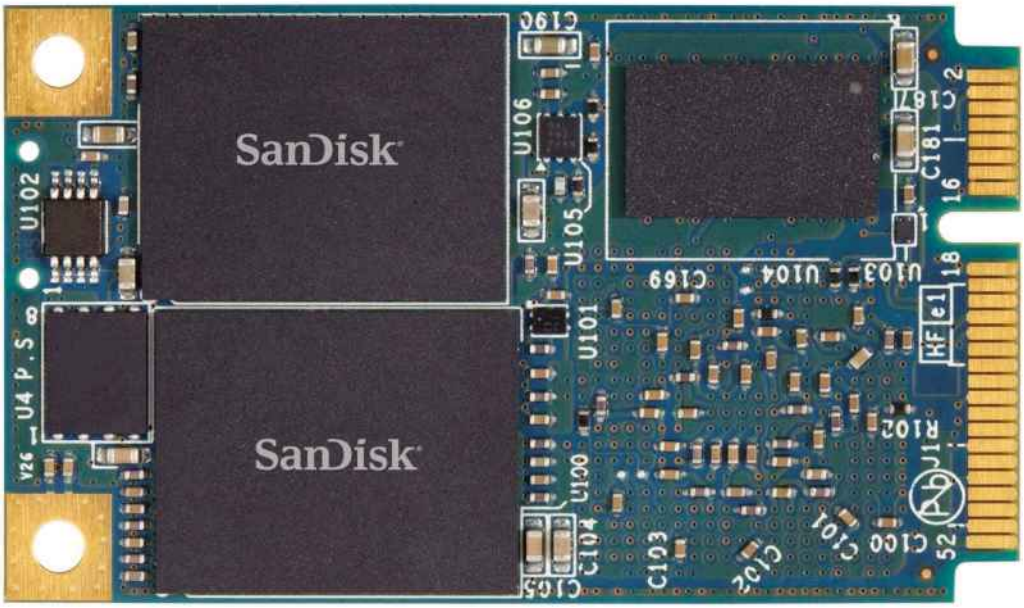
Our basic boot to the Windows 10 desktop, real-world test was timed at around 8.5 seconds – a tad slower than the Crucial MX200 mSATA drive. Again, though, it's worth mentioning that eight and a half seconds is still pretty quick to get to the desktop, even by today's modern speed standards. If you're as old as we are, then you'll recall having to wait minutes in some cases before you could actually use your computer after powering it up.

On the face of it, the Plextor 256GB M6M mSATA is a good enough drive. It'll certainly put some spring into the step of an older laptop or small media centre. However, the main bugbear we have with it is the cost. For around £104, it seems rather expensive, especially since the Crucial MX200, at 250GB, can be had for just £76. Even with Plextor's good name on the product, would you be willing to fork out an extra £28?

Overall, it's a good mSATA drive. It may not have the fastest benchmark numbers to its name, and it's a little too expensive for our liking, but if it's all you have available and you're desperate for a significant performance upgrade, then it'll do the job well enough.

Sandisk 256GB X110 mSATA

DETAILS
- Price: £64
- Manufacturer: Sandisk
- Website: goo.gl/ADS0q7
- Requirements: mSATA interface, Windows, Linux, Mac compatible



Sandisk released a number of SSDs in late 2013 and throughout 2014, ranging from the more run-of-the-mill SSD Plus models, through to the Extreme Pro range. Among them were the mSATA versions, which never quite reached the Extreme Pro level but still offered a decent upgrade for notebook users.

The Sandisk 256GB mSATA on test here is the slightly older X110 model, with the Ultra II now the preferred model from the company. Capacities range from just 30GB to 64GB, 128GB and, of course, 256GB. Each uses a decent Marvell SS889175 controller with Sandisk's custom 19nm NAND memory, along with 128MB of DDR2 on-board cache.

The Sandisk X110 supports such features as TRIM, S.M.A.R.T., Thermal Throttling, low power consumption, dynamic and static wear levelling, and AES 256-bit encryption, plus it has an impressive lifespan of two million hours. However, possibly due to its age, it does lack the more exotic features of some of the other mSATA drives on test, such as auto garbage collection and other such wonderful things.

We did expect, then, a slightly lower score on the ATTO benchmarks, and unfortunately we were right this time. The 8192KB file transfer managed just 458MB/s and the similar sized write speed was recorded as a rather poor 348MB/s.

The 4KB file size transfers weren't too bad, though, with the read speed at 338MB/s, while the write speed was 296MB/s. Again, though, with regards to the bigger file sizes, they're hardly blistering speeds for enthusiast builders or those wanting to hit higher benchmark scores against their rivals. The smaller file tests, though, were the fastest we've had (bar the 302MB/s write from the Samsung EVO).

The boot to the Windows 10 desktop was complete in 12 seconds this time, which puts it at the bottom of the group in terms of the real world test. However, compared to the 2.5" standard hard drive we had in before the test, it's immensely faster.

In a comparison to other mSATA drives, the Sandisk X110 doesn't come out on top, but it is the cheapest model on test for the amount of storage on offer. At just £64 for 256GB, it's not a bad deal for an aging laptop or notebook with mSATA capabilities and if, like us, you moved on from a standard spinner, then regardless of the speeds of the other models we've mentioned, it'll breathe new life into your old machine.

However, as it stands, the Sandisk 256GB X110 mSATA isn't quite up to the same standard as the rest of the group. This, as we mentioned, is probably due to the fact that this is oldest drive in the group. The more up-to-date Sandisk models appear to be on a par with the likes of Crucial and Plextor.

In short, then, unless this is the only mSATA model that can fit in your machine, you're better off with one of the other drives here. If, though, it'll fit where others won't, then it'll do a good enough job at giving your laptop a much needed performance boost.

Although slower on the bigger file size transfers, the Sandisk X110 is very quick on the smaller file sizes

For the capacity, though, it's the cheapest model on test

Samsung 120GB 850 EVO mSATA

For the capacity, speed across the big and small file sizes and how quickly it got us into the Windows 10 desktop, we're going to opt for the Samsung 120GB 850 EVO mSATA as this week's winner.

Kingston SSDNow 120GB mSATA

Slightly cheaper than the Samsung, the Kingston SSDNOW 120GB mSATA proved to be just as good. It has everything you could ask for from a modern drive, and it didn't score too badly in the benchmark tests either.

How We Tested

Each drive was installed in a Gigabyte P37X laptop, with 16GB of memory and a clean copy of Windows 10 imaged to each new drive. We ran ATTO as the basic benchmark and also timed how long it took to boot to the Widows 10 desktop from the end of the BIOS display.

	Kingston SSDNow 120GB mSATA	Transcend MSA370	Crucial MX200 250GB	Samsung 120GB 850 EVO	Plextor 256GB M6M	Sandisk 256GB X110
Price	£50	£200	£76	£56	£104	£64
Capacity	120GB	512GB	250GB	120GB	256GB	256GB
8192KB Transfer Read Speed	560MB/s	563MB/s	562MB/s	552Mb/s	516MB/s	458MB/s
8192KB Transfer Write Speed	534MB/s	487MB/s	513MB/s	533MB/s	434MB/s	348MB/s
4KB Transfer Read Speed	159MB/s	137MB/s	138MB/s	350MB/s	247MB/s	338MB/s
4KB Transfer Write Speed	255MB/s	283MB/s	116MB/s	302MB/s	214MB/s	296MB/s
Windows 10 Boot Time	7 seconds	7 seconds	8.2 seconds	6 seconds	8.5 seconds	12 seconds

Your Letters

Xoning Out

By chance. I was re-reading *Xone Of Contention* by Piers Anthony [**tinyurl.com/np4fsrn**] when I saw what was in issue 1372 about Windows 7 ['Where Now For Windows 7?']. I think that ALL those who attempt to produce operating systems at Redmond should be tested on memorising the first part of *Xone Of Contention*, and anyone who does not know what Piers was writing about should be forced to pay back ALL the salary he or she has received from Macrohard. Those who have caused the complaints mentioned by Piers should be banned forever from working on operating systems.

I have used, or tried to use, all versions of Windows from 3.0 onwards (except Windows 95 and Windows ME). It must have been just the aim to raise more money rather than improve Windows XP that Vista was produced. One would have thought that there might be someone at Microsoft who could remember the effect of producing something as rotten as Windows ME before Vista was launched.

I have been more or less forced to change to a pre-installed version of Windows 7 when my faithful XP PC died. I can't understand why Windows 7 is apparently so popular after suffering from the "super" features in it that are not in XP.

It is typical of Microsoft to produce a pop-up taskbar when the majority of web users add anti-pop-up software to their browsers.

If I was a powerful wizard I would curse the person who thinks that a pop-up taskbar is a good thing. The curse would apply to the pop-up person and all his/her relations. The lower half of the windscreen in any vehicle he/she or they are travelling in will be filled with a distracting image for two seconds whenever the vehicle goes near the edge of the road or the lane separator. This curse would apply until the pop-up person sends every Windows 7 user the software to banish the distracting and time wasting pop-ups (try to banish the pop-up taskbar with the help Windows 7 provides).

That simpleton should join forces with the idiot who assumed that all file lists should ALWAYS be in alphabetical order. He should be FORCED to work in a library re-labelling book lists from first name first to last name first. He will then find that his "lovely idea" of providing automatic alphabetisation ALL THE TIME is one of the most stupid time wasting features ever added to an operating system.

I wonder if there are any readers who can provide an open source package of software that will provide the maximum protection possible for a Windows XP installation. XP was around long enough for almost all of its sillinesses and bugs to be removed before Microsoft ceased to support it. I wasn't perfect, nothing is, but it did not have the feature in Windows 7 that prevents the user from accessing some of his own files.

When, I wonder, will we get a version of Android to run on an X86 PC that will kill off Macrohard forever?

Wilf James

P.S.
I strongly recommend all *Micro Mart* readers to obtain or borrow a copy of *Xone of Contention* by Piers Anthony. Piers is now 80 (if he is still around) and used some of the first word processing software available in DOS. He knows all about the stupidity of many of the "desirable" features added to operating systems devised by people who have no idea what it is like to use an operating system for serious work. My experience has been very similar to that of Piers (I am now 79), but I have never been as successful as him as a fantasy story writer.

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Code With AI2

PPI Calculator

Build an Android display PPI calculator app with David Briddock

Over the last few issues we've used App Inventor 2 (AI2) to build a useful timer, a motion-activated dice shaker and a fully functional web browser.

This time we're going to build a display pixel density calculator based on a pixels-per-inch (PPI) formula.

Remember, all you'll need to play along is a Windows/Mac/Linux PC, a web browser and a Google account. Ideally, you'll also have an Android smartphone or tablet, but even this isn't essential.

What We'll Learn

This time our screen design involves a number of label and text box pairs. To arrange these pairs correctly we'll introduce the TableArrangement component, which makes the whole process pretty straightforward.

As you probably guessed, there's some maths involved here, which gives us an opportunity to explore some of the code blocks in the Math group.

In addition we'll use a local variable (as opposed to a global one), where the scope is limited to its inner blocks.

Starting AI2

In your browser, navigate to the AI2 home page (**ai2.appinventor.mit.edu**) and sign in with your Google account.

We need a new project, so in the Projects menu select the 'Start new project' option and give it a meaningful name, such as 'MMPPICalc'.

Screen Properties

We're automatically taken to the Designer View, where there's already a component called 'Screen1'.

In the right-hand Properties panel, ensure the AppName is set to 'MMPPICalc, then set the Title to 'MM PPI Calculator'.

Now we'll add some screen components.

Table Component

First we'll add the table. In the left-hand component Palette panel, open the Layout group, grab a TableArrangement component and drop it into the Screen1 area in the Viewer panel. With this table selected in the Properties panel, set the Width to the 'Fill Parent...' option.

We're going to have four rows in total, and each row has two items (a label and a text box), so we'll leave the Columns property set to two but change the Rows property to four.

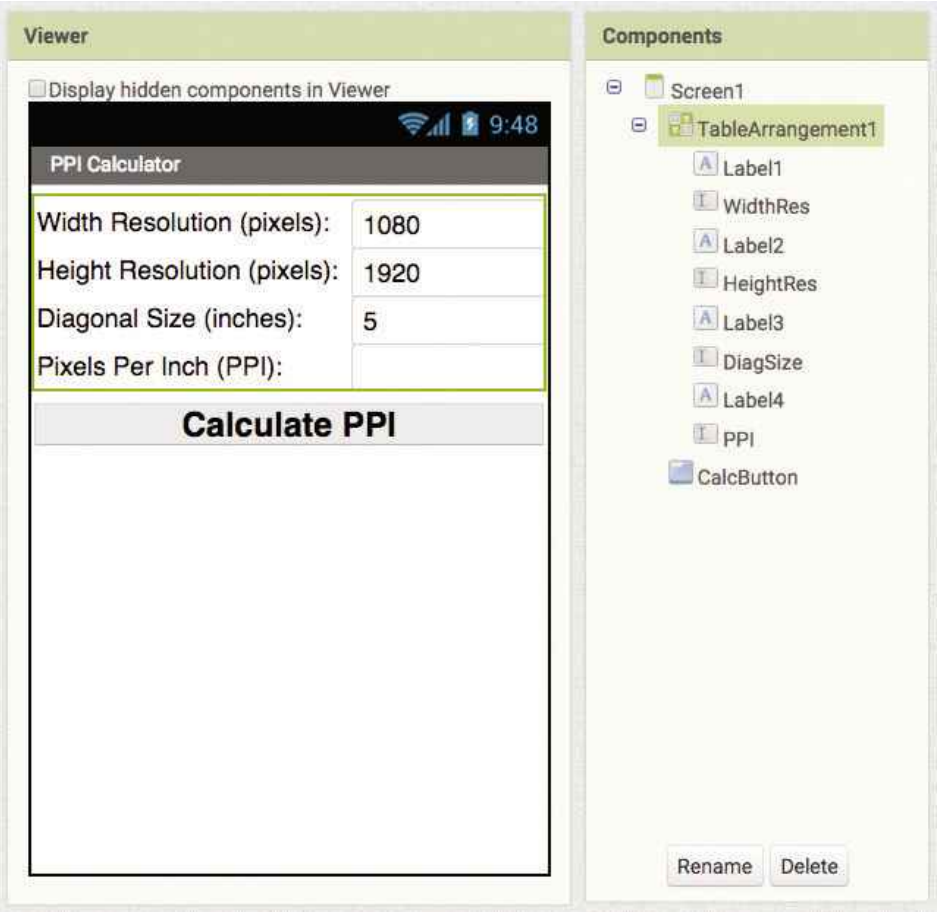
The left column contains our field labels. In the right column there'll be three numeric-only input fields plus a read-only calculation output field.

Adding Table Rows

Now we'll add our label and text box pairs as table rows. From the component Palette open the User Interface group and grab a Label. Drop this label into the top-left corner of the table. A blue bar appears to indicate its drop position. In the Properties panel, set the FontSize to 18.0, remove the Hint text and set the Text to 'Width Resolution (pixels):'.

Now grab a TextBox and drop it to the right-hand of this label. Rename it to 'WidthRes', then set the FontSize to 18.0, click on the NumberOnly checkbox and set the Text to 1080. This completes the first row.

To create a second row, repeat this process, dropping the Label and TextBox directly underneath the previous ones. This



AI2 designer view

time, the label's Text is 'Height Resolution (pixels):', the text box name is 'HeightRes', and its Text value is 1920.

Repeat this process again for row three, dropping the Label and TextBox directly underneath the previous ones. This time the label's Text is 'Diagonal Size (inches):', the text box name is 'DiagRes', and its Text value is five.

Repeat this process one last time for row four. Set the label's Text to 'Pixels Per Inch (PPI):'. For the text box, rename it to 'PPI' and ensure the Text is empty. Unselect the Enabled checkbox so it becomes a read-only field. To highlight this calculated value, select FontBold and set the TextColour to Blue.

By the way, the default numbers we've used relate to a Google Nexus 5 smartphone's display.

Calc Button

To perform the calculation we'll need a Button component. Grab one from the User Interface group and drop it directly below TableArrangement1, using the blue bar as a guide.

Rename it to 'CalcButton', then select FontBold, set the FontSize to 24.0, set the Width to the 'Fill Parent...' option and the Text to 'Calculate PPI'.

App Code

Now it's time to start coding, so click on the 'Blocks' view button.

The only event we're concerned about is a button click. From the CalcButton component, grab a brown 'when CalcButton.Click' block, and drop it into the coding area.

First we'll create a local variable. From the Variables group, grab an orange 'initialise local name to' block and snap it inside the brown block. This is the diagonal resolution value, so change the 'name' to 'DiagRes'. Finally, add a simple blue Math value block, a zero value is fine.

Note that only blocks inside this local variable block can access the 'DiagRes' value.

Pythagoras

The diagonal resolution is obtained from the Pythagoras' theorem we all learnt at school (**goo.gl/8Fg3xE**). Hover over the local variable to get an orange 'set DiagRes' block. Now grab a blue square root block from the Math group and snap it onto the end.

Next grab a Math addition block and snap it next to the last one. There are two empty holes to fill.

For the first, grab a power of ('^') Math block and snap it into the first hole. This also has two holes. The first is filled with a light green WidthRes.Text block and the second with a simple value block set to two.

Repeat this process to fill in the second addition block hole, but this time use a light green HeightRes.Text block.

Now we have the diagonal resolution, the PPI is obtained by dividing it with the display's diagonal size. Grab a green 'set PPI.Text block' and snap it underneath the orange 'set DiagRes' block.

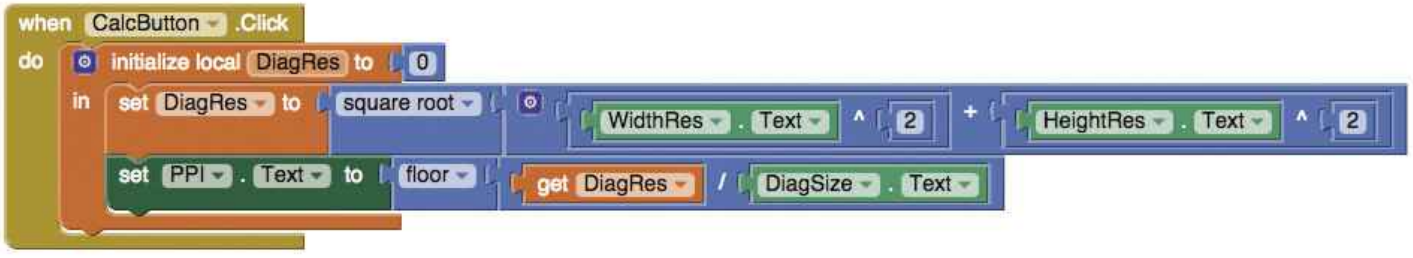
We want a whole number to be displayed, so first snap into place a Math floor block. Finally, we just need a division Math block, which contains the 'get DiagRes' and 'DiagSize.Text' blocks respectively.

All Done

We've finished coding, so ensure the warning and error counts in the bottom left are both zero, and carefully check your code against the Blocks View image.

Test with the Connect menu's Emulator option or with the AI Companion App installed on an Android device.

Next time, we'll build a sketching app with the flexible canvas component. **mm**



AI2 blocks view

75 Million Reasons To Be Cheerful

Microsoft is declaring the first month of Windows 10 a success. But what conclusions can we really draw about the reception of this critical update?

Technology companies can be rather frugal with concrete information from time to time. This is understandable, because hard numbers sometimes misrepresent a good situation as bad. However, they can also represent a bad one as exactly what it is, unfortunately.

As a general rule, if a business is giving chapter and verse on how many of something it's sold, it's usually good news, and if it's being very vague or just not saying anything, then it's invariably a less wonderful story to tell.

That's precisely the context in which to place the recent drum banging by Microsoft about Windows 10, because it comes on the back of an effective news blackout on Windows 8 sales that we can all understand it would like to move on from.

For the first month, it's been a solid start, because neither Windows 7 nor 8 could claim 75 million installations over this period, and that's how many Windows 10 installations Microsoft claims to have been bagged.

But conversely, Windows 10 is free to owners of the previous two operating systems, so that's clearly a factor in convincing people to make the move. And Windows 8.x wasn't much liked by the general populous, making for yet another rogue component.

Is convincing so many people to adopt their new OS proof that Windows 10 is a winner for Microsoft? Or is it all a bit more complicated than the obvious and immediate conclusion to draw?

To get a better grip on this question, we need to go back to Windows 7 and 8, and build some sort of model for how Windows transitions happen and compare that with what we know about Windows 10 so far.

Windows 7

According to the best information available about Windows 7 sales, Microsoft sold 60 million licences over the first two months after launch, and it then went on selling roughly 20 million copies a month for the next three years or so.

"After Windows 7, many in Microsoft must have thought its flagship product was an untouchable brand, but its next upgrade proved exactly the opposite"

As operating systems go, Windows 7 was massively successful for Microsoft, coming as it did after the woeful Vista episode.

Within the first six months, 10% of PCs in the world were running Windows 7, and eight months after that 20%. In fact, the percentage of computers running Windows 7 has grown almost continually since, even after Windows 8 launched.

However, what's different about the 60 million copies number here is that this wasn't installations; it was licences shipped, and that is something quite different.

Amazing Quotes About Windows 8

Then CEO Steve Ballmer in October 2012
"670 million Windows PCs just waiting to be upgraded to Windows 8," and "It is going to sell a few copies next year."

Forbes in March 2014
"If you look at the numbers, though, Windows 8 is actually quite successful."

Microsoft spokesman on February 2014
"Windows 8 has surpassed 200 million licences sold, and we continue to see momentum. This number includes Windows licences that ship on a new tablet or PC, as well as upgrades to Windows 8."

Merle McIntosh, Newegg's senior vice president of product management in November 2012
"We were prepared for some pretty big upside on the software side of the equation, and the hardware side of the equation, and it is has been steadily improving. But it did not explode, as I think you know, coming out of the gate,"

Windows CFO Tami Reller in May 2013
"We recently surpassed the 100 million licences sold mark for Windows 8. This number includes Windows licences that ship on a new tablet or PC, as well as upgrades to Windows 8. This is up from the 60 million licence number we provided in January."

And then Tami again in July 2014
"Is it perfect? No. Are there things we need to change? Absolutely. We are being very real about what needs to change and changing it as thoughtfully and quickly as we can",

Paul Thurrott, long time Microsoft champion and tech journalist in February 2014.
"Windows 8 is a disaster in every sense of the word. This is not open to debate, is not part of some cute imaginary world where everyone's opinion is equally valid or whatever. Windows 8 is a disaster. Period."

Steve Sinofsky, in May 2013.
"It's hard for me to look at selling 100 million of something and not be happy,"

This is a trick phone makers often use to make their sales seem bigger, where they count every phone that has shipped to a phone reseller as sold. But they're not, and it's likely that after the initial delivery there won't be any more shipments until that stock is sold.

Windows 7 was still in an era where retail disc versions were shipped to shops where they sat on a shelf, waiting for happy punters to come along with hard cash.

What some have also forgotten is that because XP was so popular and Vista much less so, Microsoft decided, not unlike Windows 10, to encourage its customers with some early discounts.

You could get a cheap Windows 7 Home upgrade, and it also did a cheap 'Family' triple pack for about the cost of a single standard licence.

No, it wasn't 'free', but it wasn't full price either, and like Windows 10, it's predecessor wasn't well received.

The sales of Windows 7 are best described as a slow burn, where people didn't charge en masse to it, but when the opportunities came along, they often moved. That's especially true of Vista installs, because those numbers dwindled to almost nothing in relatively short order. Whereas the number of Windows XP users is still many tens of millions, the number of Vista users left now is miniscule.

After Windows 7, many in Microsoft must have thought its flagship product was an untouchable brand, but its next upgrade proved exactly the opposite.

The sales of Windows 8 were so bad that Microsoft made great efforts to obscure the true numbers, mostly out of utter embarrassment.

Windows 8

Based on Windows 7 numbers, Windows 8 needed to ship more than 30 million in its first month to show its predecessor a clean pair of heals. And, amazingly, it did that.

According to the numbers Microsoft released, 40 million licences shipped in the first calendar month, but again this is licences shipped, not sold or installed. Many that did sell went to businesses with no intention whatsoever of installing Windows 8.

Pointedly, Microsoft gave no breakdown of how many were installed or shipped pre-installed on computers. Two things gave away the true situation that only those inside Microsoft knew, one of which was the last official numbers on Windows 8 that it issued.

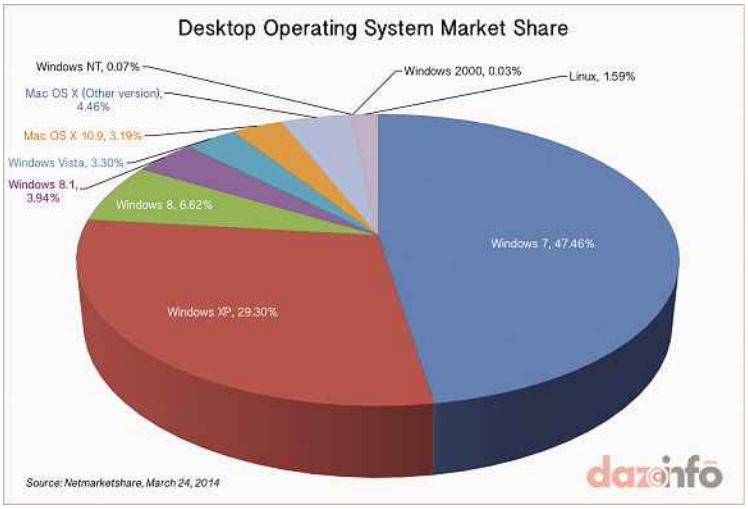
They next came in June 2013, when Microsoft declared that the 100 million mark had been reached. That was the last report on the total sales Microsoft would ever make about Windows 8 sales to this day.

It doesn't take the maths skills of Stephen Hawkins to work out that if you sold 40 million in month one and then eight months later you'd only sold another 60 million, then something had gone very badly wrong indeed.

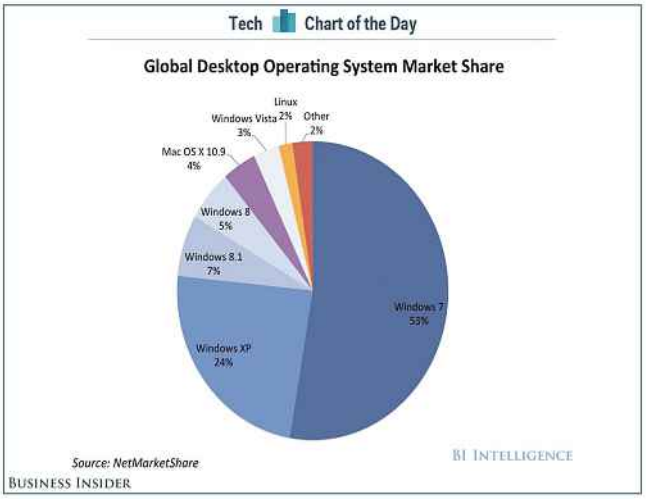
What had happened was that after the initial launch, sales plummeted like Microsoft was selling a contagion, and they

Windows Sales Numbers (With Source)

- Windows 1.0 sales from its November 1985 launch to April 1987: 500,000 (Computerworld).
- Windows sales in 1988 (Windows 2.0 shipped on December 9, 1987): one million (InfoWorld).
- Windows sales, all versions, 1985 to January 1990: less than two million (InfoWorld).
- Windows 3.0 sales, first year: four million (InfoWorld).
- Windows 3.1 sales, first three months or so: three million (InfoWorld).
- Windows 95 sales, first year: 40 million (Network World).
- Windows 98 sales, first four days: 530,000 boxed copies through retail channels (New York Times).
- Windows 2000 sales, less than a month after launch: one million (Microsoft).
- Windows ME sales, first three days: 200,000 boxed copies through US retail channels (Network World).
- Windows XP sales, first three days: 300,000 boxed copies through US retail channels (Network World).
- Windows XP sales, just over two months after launch: 17 million (Microsoft).
- Windows XP sales after five years, 400 million (IDG) .
- Windows Vista sales, one month after launch: 20 million (Microsoft).
- Windows Vista sales, 180 million after 18 months (Microsoft).
- Windows 7 sales, first six months: 100 million (Engadget).
- Windows 7 sales from October 2009 launch to June 2010: 150 million (Neowin).
- Windows 7 sales in less than two years: 450 million (TechCrunch).
- Windows 8 sales in a little over two months: 60 million (ZDnet).
- Windows 8 sales, first six months: 100 million (Microsoft).
- Windows 10 installs, first month: 75 million (Microsoft).



A graph based on data created by Netmarketshare in March 2014 showed the very deep hole that Windows 8.x had dug. At a little under 4% of the desktop market share, it was barely ousting the unloved Windows Vista. Meanwhile, XP was clinging on to nearly 30% after 13 years, and Windows 7 had the lion's share at 47%. If we move on to October of 2014, things had improved for Windows 8.x but not to the extent that Microsoft might have hoped for



Windows 8 and 8.1 combined now have 12%, but because they were on virtually every new PC sold in the previous previous months, that helped. However, Windows 7 grew by 6% over the same period, absorbing Windows XP users after their support ended

never recovered in any meaningful way even when Windows 8.1 was introduced.

It's worth remembering that during this entire fiasco, Microsoft was making lots of positive noises about how happy it was with Windows 8 sales, when it knew it was facing a total meltdown.

Based on statistical data gathered by analysts beyond Microsoft's control, it's been estimated that whereas Windows 7 took six months to reach 10% of the PC market, it took Windows 8 a whole 15 months to hit that level. At that point the sales curve went almost flat, and it never really got much above that, peaking at about 12%. At the rate it was gaining on other versions of Windows, it was estimated that it might take anything up to 150 years to become the most popular release.

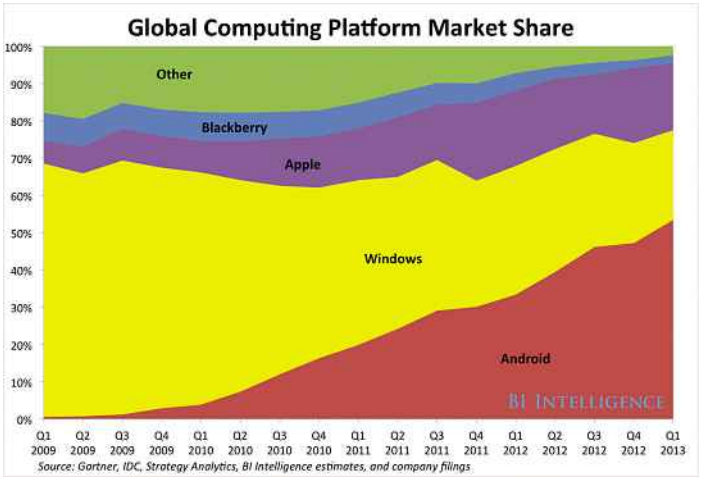
By comparison, even the generally reviled Vista managed a peak of 23.6% of the Windows market, before Windows 7 arrived.

For proper balance, I should mention that there were more computers in the world in the Windows 8 era than the Windows 7 one, so reaching the percentages took more sales, but that doesn't really make up the difference. Windows 7 peaked at more than 50% of all systems at one point, and Windows 8 never threatened to overtake Windows XP or Windows 7.

But there was another clue about when Microsoft realised Windows 8 wouldn't fly, and it was the departure of Windows 8 senior software architect Steven Sinofsky just three months after Windows 8 launched. His exit, which according to many was a mutually agreed move, can only been because of Windows 8 sales and his part in the design so many people disliked, because whatever personality traits Sinofsky had, he'd been at Microsoft since 1989 and led the Windows team since 2009, so they all knew who he was and how he operated.

That he left on 31st December 2012, to take $14M in stock for his one-year incomplete contract, and various internal sources identified him as the reason that Windows 8 failed so completely.

That it happened then demonstrates that even at that stage Microsoft knew how these runes would land in the



When Windows 7 launched in 2009, the platform represented nearly 70% of all computers in use on the planet. And that's how things generally went until Q1 2010.

This graph shows at that point Android started to grow very rapidly, and the overall proportion of machines running Windows declined markedly.

These figures don't include the last 30 months, where the pinch has become even greater since Windows 8 came to market.

Windows 10 probably has an impossible task to put the market share back to anything near what it once was, and just not conceding more territory might be considered a win of sorts

coming months, and with Steve Ballmer looking to hand over to someone else, he was the first person the new Microsoft wouldn't be requiring. He handed over to Julie Larson-Green and Tami Reller, so perhaps it would be useful to keep an eye on their career paths around Christmas time.

In the end, mostly because it was an elephant in the room larger than the state of Texas, the company finally admitted that Windows 8 hadn't been the rip-roaring success it had hoped for.

However, it took until October 2014, nearly two years after it parted company with Steven Sinofsky, for new CEO Satya

Intel's CEO Brian Krzanich doesn't think Windows 10 will reverse the trend of reduced PC sales. "We are going through another transition, Windows 10 upgrades...We're seeing some quarter-to-quarter pushing, but we continue to take a view of our long-term forecast...the PC market should be flat to slightly down mid single-digits over the long-term."

Nadella to say, "Let's face it, we got some things wrong in Windows 8."

So based on both these prior models, is Windows 10 going the way of version 7 or 8?

Windows 10

I find it highly refreshing that Microsoft chose to release numbers on activated installations, because that's surely much nearer the real picture than some dressed-up quirk of accounting being passed around as gilt-edged success.

And, as activated installations go, 75 million in the first month is a pretty healthy situation. However, as Windows 8 well demonstrated, the first month isn't really representative of success, because of the numerous special circumstances that surround a new launch.

In this instance, being 'free' is one, although if people hate Windows 10 and revert their licences to Windows 7 (or 8, disturbingly), then that could really mess with the statistics from here on.

What Microsoft will never know is how many of those installations would have happened if Windows 10 cost money at this stage. Information it might have, but isn't sharing is the breakdowns of in-place upgrades. If the vast majority of these are Windows 8 users desperate to get away from that release, then that's a lot less encouraging than if they're Windows 7 users ready for a fresh OS.

Based on my own experience, in that the only machine I've upgraded so far is a Windows 8.x one, I suspect that many of these installations are erasing Windows 8 at this point. Only Microsoft knows the real situation, and it hasn't fired anyone senior yet.

With this being the first version of Windows that's 'free' to a large chunk of existing users, Microsoft needs to hold its nerve and watch what trends develop over this special year – because even if Windows 10 only cannibalises all the Windows 8 licences over that time, it will have a good chunk of the overall market, and it will have at least bettered Windows 8 for how rapidly it got that many together.

To also put this into perspective with Apple, which it's generally accepted has a user base of around 100 million worldwide, by the time you read this, there will be more Windows 10 systems in use than those running Mac OS X globally.

Having just watched the World Athletics Championship, the Windows 10 situation reminds me much of those who see GB athletes win medals in Beijing and then tick those same boxes for success in the Rio Olympics.

Those battles have yet to be won, and in many respects Windows 10 has yet to even start on ticking the box that puts Windows back in the position of grandeur it once occupied.

Given how the world of computing has radically changed in the past decade, maybe Microsoft's expectations are rightly more modest.

Therefore, it might be cheered by the response to Windows 10 so far, but also mindful that it's in it for the long haul and not to celebrate before it's really confident about what it's seeing from both a bought licence and user activity statistics.

> **Given how the world of computing has radically changed in the past decade, maybe Microsoft's expectations are rightly more modest**

We're a long way from erasing Windows 8 from the minds of many, though at this time Windows 10 appears to have taken a few confident first steps.

Only if Microsoft can entirely unify the Windows world around this OS can it ever be classed as a true success, and given the generally positive vibe people still have about Windows 7, that might be a tall order.

I've no doubt it can easily cannibalise the Windows 8 user base, but there is still a big question about going beyond that objective and how the year of free upgrades is likely to change the perceived value of this product in the longer term.

What it can't address, however well it is ultimately received, is that since iOS and Android began their respective rises, the concept of a full desktop OS has taken a bashing. With so many people doing many of their daily computing tasks with just a phone or a tablet, the necessity of a desktop OS has been severely undermined.

Windows 10 might have had the dream start that Microsoft would have hoped for, but that doesn't imply that it can undo the change that's occurred in the past five years to the fabric of computing. **mm**

Stacking The Deck

Anyone who's worked in a big company knows that those with the fiscal controls often present a different profit and loss picture than the one that accurately represents the state of play.

One of the classic tricks is to defer taking profit at one point in the year, to then pull it like a rabbit out of a hat later on. The basic logic of this is if news is bad, then make it as bad as it can be, and then at the next performance announcement, confuse stockholders by making the numbers correspondingly better than expected.

So how does this relate to Windows and Microsoft? Using Windows 8 as a classic example, here is how it all works.

In 2012, prior to the launch of Windows 8, Microsoft deferred $540m of revenue from Q2 of that year, and then another $1.36bn in Q3 from the Windows division. The excuse given for this was that it intended to give a cheap Windows 8 upgrade to anyone who bought Windows 7 close to the launch, and that was to cover that cost.

This assumes they'll all upgrade, which Microsoft knew wouldn't happen, and it also only took the revenue when they did the upgrade or on 28th February 2013.

In this way, Microsoft had $2bn in the back pocket which by March 2013 would come back on to the profit and loss account for the Windows division even if it didn't sell a single copy of Windows 8.

In addition to making the Q1 2013 sales of Windows 8 look impossibly good, this also had the added benefit that it made the actual number of copies sold almost impossible to calculate for those trying, like most tech analysts would be.

However, there are limits to how much you can play these games, and those that push the boundaries can incur the wrath of the US Securities and Exchange Commission, as well as their own stockholders for misrepresenting their profitability.

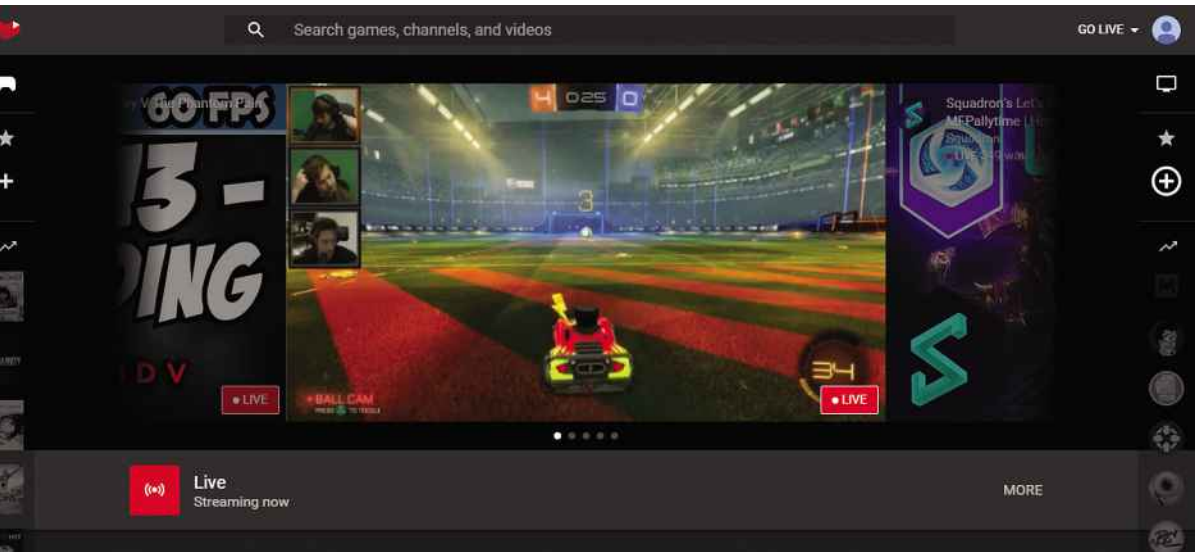
Microsoft chose not to go there, admitting that Windows 8 wasn't selling as many copies as it had hoped, but it actually avoided saying just how badly it did.

Additionally, all new Windows releases generally get a leg up, because from shortly after the point of release, all new PCs come with the new OS. However, this point went rather wrong with Windows 8, when end users started demanding Windows 7 or, in the case of business users, exercised downgrading rights.

It's generally accepted that because the usage figures for PCs browsing the internet didn't match those licences that Microsoft claimed to have sold, a great many PCs got downgraded.

This why it's so important that Microsoft is now stating installed and activated numbers, because otherwise the sold licence figures are open to whatever interpretation you wish to apply to them.

What's also different is that Microsoft has changed the way that it accounts for Windows revenue, choosing to take the amount it receives at point of sale and spread it over the next three years. This, and the relatively low numbers of actual Windows 10 sales in the next 12 months (rather than free upgrades) will probably make the numbers for this division even more confusing to unravel.



What Does **YouTube** Have To Offer **Gamers?**

YouTube recently announced the launch of YouTube Gaming. What is it, and what will it mean for other online gaming services? Sarah Dobbs finds out

Ever got stuck on a game and turned to the internet for help? Chances are, you ended up watching a walkthrough on YouTube to help you nail that tricky puzzle in *Portal* or seemingly impossible quest in *Skyrim*. Whatever your console of choice, whatever your gaming style, there's a video of someone else playing your favourite game on YouTube – plus hours upon hours of people showing off weird game glitches, explaining how to cheat or just talking about their high scores.

It might not have come as a surprise, then, that YouTube recently announced it was launching a new app and website dedicated to gaming. Named, imaginatively, YouTube Gaming (**gaming.youtube.com**), this new subdivision of the video sharing site will be home to all kinds of gaming-related material, from speed runs to live streams of gamers showing off their skills.

If you're already immersed in gaming subculture, that might sound like a familiar idea, because there's already a dedicated video site for gamers to showcase their in-game achievements. It's called Twitch (**www.twitch.tv**) and its whole reason for being is to let gamers share gaming-related videos. Owned by Amazon, Twitch isn't some tiny start-up; it's a massively popular site with more than 100,000 million visitors a month.

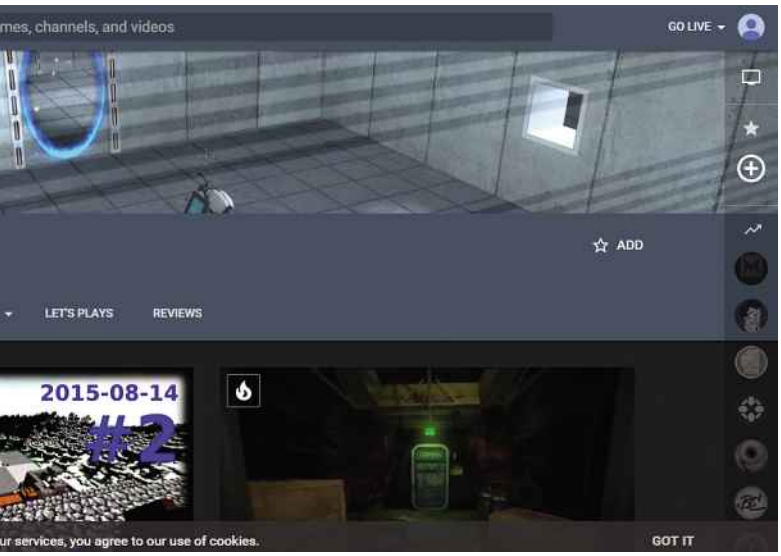
So what can YouTube bring to the table to lure people away from Twitch? Should Twitch be worried, or will YouTube Gaming end up being another ambitious Google project that ends up getting quietly shut down a few months down the line? Let's take a closer look…

What Is YouTube Gaming?

First, let's see what YouTube Gaming actually is. There's already tons of gaming-related content on YouTube, so at first it's hard to imagine why anyone would think it needed to be given its own special banner. The blog post from YouTube Gaming project manager Alan Joyce explains some of the details, and a lot of it seems to be about organisation. Within the YouTube Gaming site, there'll be dedicated pages for more than 250,000 games, so if you want to see all the latest videos related to, say, *Fallout 3*, you'd go to the *Fallout 3* page to see everything in one place, instead of clicking through page after page of search results.

All YouTube Gaming users will be able to set up 'collections': essentially, lists of all the games they're interested in or playing, so they can easily find new videos about them. Like bog standard YouTube too, users will be able to subscribe to specific channels, so you can follow your favourite bloggers or friends and see what they've recently uploaded at a glance too.

Live events are also a focal point, and Joyce says YouTube Gaming will be set up to make the "live experience" a simpler one, with streamlined links and an easier-to-use scheduling process. That's all fair enough, but it's not really specific to



gamers, is it? You'd think anyone who uses YouTube for events and live streams might be interested in everything getting easier.

Still, YouTube Gaming is a work in progress, and everything it's mentioned so far sounds pretty good.

How's It Different From Twitch?

The difference between Twitch and YouTube Gaming, at least from what we can see of it right now, is that Twitch focuses on live streaming. YouTube Gaming emphasises its live streaming capabilities too, but there will also be standard videos, just like on non-gaming YouTube. For Twitch, though, live streaming is its raison d'être. Originally, Twitch was a spin-off of Justin.tv, a live streaming platform created by Justin Kan for life-casting – that is, it was a platform for anyone to stream videos of themselves, whatever they might be doing. Twitch.tv was created as a gaming-related subdivision, but it became more popular than the original platform, which shut down last year.

> **"Twitch offers a lot of the features that YouTube Gaming plans to offer"**

Twitch became so popular, in fact, that it was acquired by Amazon last year for a whopping $970 million. It's been host to all kinds of enormous gaming competitions, it's run huge charity fundraisers, and it's a recognisable presence at gaming conventions and trade fairs. Thanks to partnerships with videogame publishers, it's even been integrated with the likes of *Minecraft* and with Steam accounts, and its developer plans to expand so that users on pretty much every platform can watch Twitch streams.

In terms of functionality, though, Twitch offers a lot of the features that YouTube Gaming plans to offer: a mobile app, high-definition streaming, featured streams and the ability to follow specific channels and interact with other users. Like YouTube proper, it has a Partner Program that allows popular users to monetise their content through ad revenue. From a user standpoint, there really doesn't seem to be much to separate the two.

Other Dedicated YouTube Apps We Want

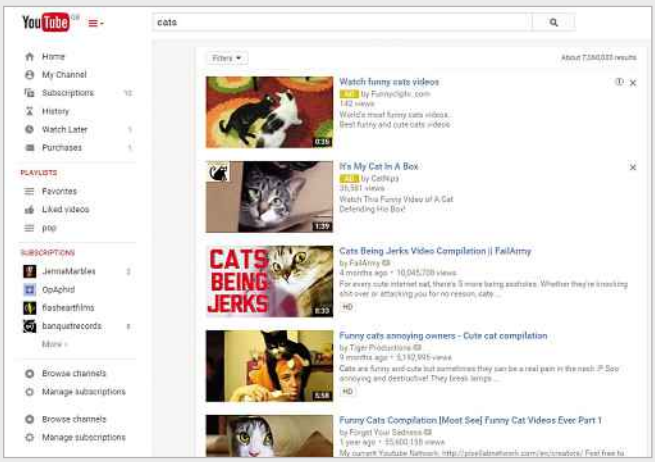
Before launching YouTube Gaming, YouTube already had dedicated services for Music and Kids content. But why stop there? We've got some ideas for new YouTube spin-offs:

YouTube Cooking
All recipes, all the time. There are loads of food-related videos on YouTube already, so why not stick them in one place and chuck in a live stream of Jamie Oliver showing us how to chop onions like a pro?

YouTube DIY
If we could monetise live streams of our rubbish attempts to reseal the bath and put up a shelf, some of our annoying household jobs might actually get done! Plus, er, some easily searchable instructional videos wouldn't go amiss.

YouTube Cats
Approximately half of all the content on the entire internet is cat-related, so Google is missing a trick if it doesn't create a dedicated cat channel. How many hours of live streamed kitten antics would we watch? It's hard to come up with an exact number, but it'd be a lot.

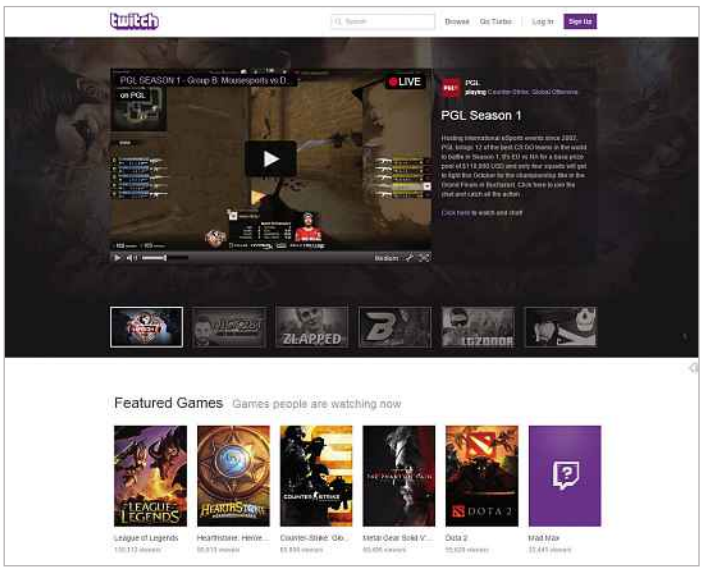
YouTubeBox
Let's go full meta: this spin-off would just feature live streams of people watching live streams. And maybe people live streaming themselves watching those too. The only problem would be finding enough viewers who weren't also broadcasters to actually click on adverts and generate the revenue to fund it all.



Player 1, Ready...

If this were a fight, it would be hard to pick a winner. In one corner, there's Twitch, a well-known brand in gaming circles with a massive existing user base, plenty of media partners and a shiny new corporate backer. In the other, there's YouTube Gaming, a new service that will be able to pull in existing YouTubers – and an equally weighty, well-connected corporate sponsor to shore it up. They're about as well matched as it's possible to be.

Or at least they will be, once YouTube Gaming gets up and running for real. At the moment, it's only available in the US and the UK, and there's nowhere near as much content on there as Twitch boasts. In time, though, it'll be rolled out in more territories, and content will soon start building up, and then… well, Twitch might need to start worrying.



Twitch.tv is currently the biggest gaming video site – but has it got competition now?

Some of Twitch's 'partners' have already started looking into jumping ship – or, at least, investigating the contractual obligations they have to Twitch. To qualify as a Twitch partner, you need to have an average viewership of at least 500 people and run a regular broadcast schedule with at least three streams per week; if you're accepted, you get a chunk of the advertising revenue generated by your content. But you also, typically, agree to keep your stuff exclusive to Twitch.

> **"The battle to be the biggest gaming video site isn't necessarily a two-horse race"**

Not all partners get the same contract, but according to Twitch, most of them include an exclusivity clause that bans gamers from live streaming their content elsewhere. That exclusivity clause might mean the issue of whether popular game-streamers pick Twitch or YouTube Gaming is forced; rather than waiting to see which works best for them, they'll have to choose one or the other. As YouTube Gaming starts to pick up steam, then, it might be worth keeping an eye on some of the most popular Twitch streamers – like Chance Morris (sodapoppin), Jordan Maron (CaptainSparklez) or PhantomL0rd (PhantomL0rd, probably not his real name) – to see whether they decide to change allegiances. Most big name Twitchers tend to have YouTube profiles already, which might not bode well for Twitch.

Other Players

To really mix our sporting metaphors here, the battle to be the biggest gaming video site isn't necessarily a two-horse race. Beyond YouTube, there are plenty of video hosting sites; beyond Twitch, there are plenty of other live streaming sites, and some of those are already very popular with gamers.

For starters, there's Hitbox (**hitbox.tv**), which is probably the most obvious alternative to Twitch. It claims its chat function makes it the best choice for streamers to connect with their audiences, and it also offers extensive analytics for users looking to boost their profile.

Then there's Ustream (**www.ustream.tv**), which is a non-gaming-specific live streaming platform and is popular with business users. Its integration with the PlayStation 4 means it's a pretty good choice for getting started with streaming games if that's your platform of choice, though.

Want even more options? How about Azubu TV (**www.azubu.tv**), a game-streaming site that's recently opened its platform up to any would-be streamers? Or Livestream (**livestream.com**) or Veetle (**veetle.com**)? Both of those are general interest streaming sites, but there's no reason gamers can't use them. Or you could try Daily Motion Games (**games.dailymotion.com**), a spin-off from Daily Motion that's currently in beta.

Or… well, between the time of writing and the time you're reading these words on the printed page, it's likely half a dozen other contenders will have popped up, hoping to nab a piece of the games-streaming pie. All of them offer similar functionality at the moment, but any of them could come up with the killer feature or play home to the next gaming superstar, and beat the others to become the new hot commodity in our endlessly fickle attention economy.

Let The Games Begin

Will YouTube Gaming be the next Gmail or the next Google Wave? Only time will tell whether the new service will be a success or not. Google has created tons of super successful products that we can't imagine living without any more, but it's also been behind some real failures. The thing that's likely to make the difference is content, and that's not really something the platform makers can control. After all, you can have the slickest, most beautiful user interface in the world, but if there's nothing there to make people come back to see more, there's not much point in bothering. The money will go where the people are, so it'll be interesting to see whether gamers flock to YouTube Gaming or find themselves more comfortable elsewhere.

See you back here in a year's time for an update on how this all played out? **mm**

Lazy Searchers

For the most part, Alan Joyce's blog post announcing YouTube Gaming was pretty sensible stuff, explaining what the service will offer and why it's cool. But there was one line we were a bit perplexed by:

"…when you want something specific, you can search with confidence, knowing that typing 'call' will show you 'Call Of Duty' and not 'Call Me Maybe'."

Now, granted, Google's preternatural ability to predict what we're searching for before we've finished typing it has made us kind of lazy about how we search the internet, but has that specific example ever really been a problem for anyone? Are there people out there desperate to find *Fallout 3* walkthroughs who keep watching the video for Fall Out Boy's 'My Songs Know What You Did In The Dark' instead? People trying to search for *Metal Gear Solid* streams who can only type 'metal' and end up scrolling through endless results for thrash metal bands instead?

We're gonna say no, this is not a real problem, and it doesn't need solving.

(Enough silliness - you can read the full blog post right here: **youtube-global.blogspot.co.uk/2015/06/a-youtube-built-for-gamers.html**)

Top 5 Technology Mysteries

A few of questions we've yet to answer...

1 Missing Hard Drive Space

No matter what size hard drive you get, after using it for five years or so, you'll likely find it teetering at the edge of complete capacity. Somehow, that huge drive you bought has filled up full of applications, games, movies, music, photos and more. However, you can be sensible about things by keeping all your media files on a different drive, which has the added advantage of protecting those files if your operating system goes wrong. But even if you do that, you'll still somehow run out of space, and no matter how many apps you uninstall, you can never seem to get it all back again without wiping the system and reinstalling the OS. Before you do that, though, check out the free program WinDirStat, which can help you work out what's taking up all the space.

2 Slowdowns For No Reason

As well as leaving you nowhere to install things, having a full hard drive can also cause your PC to become sluggish and generally less enjoyable to use than it otherwise would be. But even if your hard drive is in tip top condition, you can still sometimes find your computer driving in the slow lane, chugging and churning over every little task. If you're lucky, you can open the Task Manager and see if anything is hogging the CPU. If there is something there like that, then it's simply a case of shutting it down and reclaiming some speed. If you're less fortunate, you won't find anything, and you'll find yourself if that odd position of having a computer that's being slow and rubbish for no apparent reason. The only rational reaction at this point is to raise your hands in the air and scream at the heavens.

3 The Emperor's Videogame

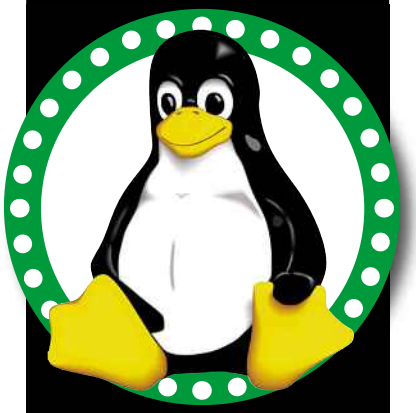
Every year, there's a new Call of Duty, a new FIFA game and a new edition of PES from Konami. And every year, these games are practically identical to their predecessors, save for a few tweaks here and there. Yet in spite of the startling lack of originality in these series, they still sell millions. People aren't stupid (well, not all people); they must know these games have barely changed, but they still go out and buy them, just to get the same game as before but with different football players or different guns. Just like the famous fictional emperor's new, non-existent attire, we just need a little kid to point at the latest EA games and say, "They've got no clothes on!"

4 Blue Screen Info

Anyone who's used any version of Windows for any significant amount of time will probably at some point have experienced a blue screen of death. It was so common with certain editions of the OS that Microsoft might as well have included it in the feature list on the box. The worst thing about it, though, is how hard it actually is to decipher the information on it. Google 'blue screen of death' for example, and you'll find long strings of text full of esoteric technical jargon that you need a PhD in computer science to work out, as well as messages that simply say something along the lines of 'An error has occurred', meaning basically, 'We have no idea what went wrong'.

5 The Any Key

We mentioned it in a different Top 5 recently (as well as several caption competitions over the years), but we're going to mention it again, because it really is one of life's great puzzles. In a hundred years, when our future descendants, with their enormous bulbous heads, ESP and flying cars, have solved every problem of science including the warp drive and the secret to eternal life, there will be a supercomputer somewhere, with a team of the world's greatest scientists working on it and trying to answer the ultimate question: where is the damned Any key?



Back To Windows

Munich looks to return to Microsoft

A couple of years ago, we reported on how the city of Munich was moving from an all Windows and Microsoft environment to a fully open source one, using a custom Linux distro called LiMux. The move wasn't an easy one, and took well over ten years to plan and implement, with the occasional hitch due to technical reasons – and a visit from Steve Ballmer himself to try and persuade the city to return to the Microsoft fold.

While reports of the council deciding to drop all the work it's done in favour of returning to MS-based programs are incorrect, the city's the new mayor, Dieter Reiter, has asked his staff to gather information and report on how much it will cost to ditch its open source systems for a Windows-based setup once more.

The report is to look into the possibility of using a combination of both proprietary and open source solutions to the various packages the departments use across the city council. According to the mayor's office, the cost of returning the 14,000 plus Linux machines back to Windows 7 would come in around €3.15m, without factoring in licensing or infrastructure costs. Also, going back to Microsoft as the main OS of choice across the council would mean writing off €14m that's already been spent in getting everything to run Linux and other open source solutions.

Apparently, the cost savings from moving to Linux in the first place were €11m, which is taken from hardware and licensing costs. That doesn't, however, take into account the training costs and the hiring of Linux consultants and support professionals, as well as training for the support staff for the many council departments. Those actual costs haven't been revealed, however many supporters of the return to Microsoft in the city council have thought that the training and support costs alone work out higher than actually sticking with Microsoft in the first place.

> **"Training and support costs work out higher than sticking with Microsoft"**

One report also mentioned that a recent staff survey across the council noted a distinct lack of satisfaction with Linux, and that this dissatisfaction extends to the entire open source operation – including OpenOffice. It's worth noting, though, that there's no direct evidence of this.

Also, in defence of a change to Microsoft Reiter has referred to a recent study from the German national security agency (BSI) that concluded Linux actually had more vulnerabilities than Windows, yet a smaller number of critical security issues. Obviously that depends greatly on the distro, or flavour of Linux the BSI tested and the version of Windows which it compared – neither of which I could find out.

Goodnight Munich

So does this mean that Munich may end up going back to Microsoft? If so, the councils that followed suit – Gummersbach, Isernhagen, Leipzig, Schwabisch Hall and Treuchtlingen – may also find that changing back will be more beneficial than sticking open source out. It certainly makes for an interesting topic of conversation, and one we'll have to keep our eyes on to see what the end result may actually be.

LiMux, the current OS for Munich councils, but for how long?

David Hayward has been using Linux since Red Hat 2.0 in schools, businesses and at home, which either makes him very knowledgeable or a glutton for extreme punishment

You Can't Go Back

Once you upgrade an OS in the land of Apple, chances are you won't be able to change your mind

I'm firmly of the opinion that the iPhone is the greatest piece of technology I've ever owned, which is why it's infuriating when the thing decides it's very much not going to work – doubly so, given that so much of my work is centred around reporting on iPhone-related apps, games, advice and accessories. What happened this time, though, was down to Apple.

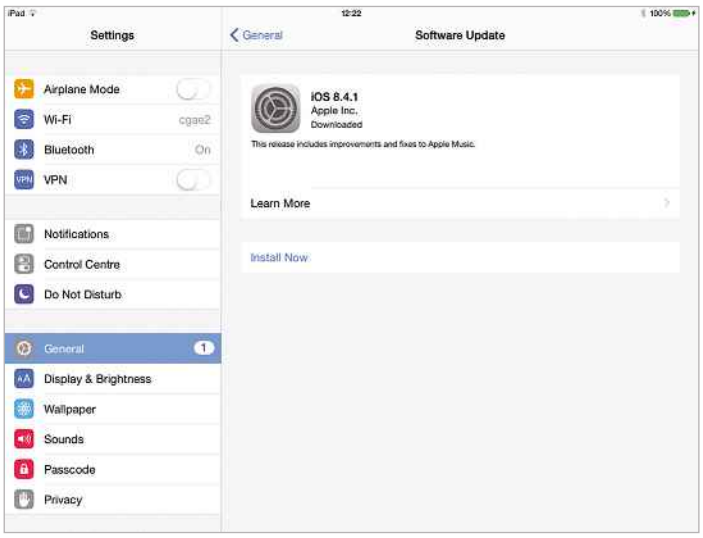
Presumably through a desire to get iOS 9 out the door, what will in all probability be the final update to iOS 8.4 was seemingly programmed by a drunk intern, randomly mashing keys and hitting Submit before forgetting about the entire thing and curling up to sleep in the corner for a week.

Because I'm some kind of buffoon who trusts Apple, I saw the update notification on my iPhone and immediately installed it. Initially, I didn't notice anything was wrong – I was in a period of manic work that didn't really involve my iPhons, so it was days later before I noticed things were amiss. My iPhone would no longer update apps, nor download new ones from the App Store (although, naturally, the App Store was quite happy to take my money). Links in Mail failed to open Safari, and Settings locked up when you tried to access certain categories.

Worse, the Apple Watch app essentially ceased to function, as did a great deal of Apple Watch extensions. Given that, in Apple's infinite wisdom, it has no way of doing much more than telling the time on its own that meant my wearable was essentially left marooned.

Then, as a final flourish, I noted the phone's battery life becoming alarmingly low, in fact the ailing iPhone was losing around 1% of a full charge *per minute*, while simultaneously becoming suspiciously hot.

Online, people helpfully offered advice along the lines of saying I was emitting a tech halo of doom (thanks) and noted that their devices were working just fine (great). A quick trip to Apple's forums told a very different story, however. People with all kinds of Apple hardware were having similar issues – or worse.



Gradually, I also had people on Twitter admit to their own horror stories, all of which seemed to be centred around iOS 8.4.1.

This was confirmed when someone noted they'd fumed in an Apple Store until they'd been given a replacement iPhone 6 (with diagnostics showing huge memory leaks and App Store connectivity issues, the 'Genius Bar' advice to "wait for an update" didn't go down well). Said replacement ran iOS 8.3, and worked fine – but you can probably guess what happened the second its owner updated.

I'm informed that the iOS 9 beta is a possible fix and is, at the time of writing, "quite stable"; precisely the sort of wording you want to hear regarding the operating system at the heart of a device so critical for earning much of your income. What I really wanted, though, was to roll back to iOS 8.4, which I'd had no problems with. Apple has other ideas on that kind of thing, however, and stopped 'signing' that version of iOS a week after its successor's release.

I and others were then left to sadly connect our devices to iTunes, and hope for the best through multiple restores. Third time's a charm, apparently, although by 'a charm', I mean that my iPhone now grudgingly downloads apps, albeit at a snail's pace, and no longer has working Touch ID. It's like a downgrade. I can only hope that, when iOS 9 appears, I'll finally get my iPhone back, and that it won't need to spend another dozen hours connected to my Mac, not entirely successfully syncing data, apps, music and photos.

Quite literally the last button I'm going to tap on my iPad.

Craig Grannell is a writer, designer, occasional musician and permanent loudmouth. He's owned Macs since 1996, when Apple was facing certain doom, and is therefore pleasantly surprised by its current success. Find **Craig** on Twitter at **@craiggrannell**

Watch Again

Ian McGurren faces the smartwatch brigade

Ian is a professional IT analyst, a semi-professional writer and a pretty amateur electronic musician. He likes gadgetry and loves making gadgets do things they were never designed to do

The Smartwatch concept, much like food served on slates and Jess Glynne, is something that people with power and influence have decided that we, the common person, are going to like whether we like it or not.

"You like technology, don't you? Then you and all your friends will love smartwatches! If you don't, maybe there's something not right about you!"

Thing is, despite Miss Glynne's surprising chart success, and pubs steadfastly refusing to revert to a good old plate, smartwatches have struggled to become at best a curio, and at worst the technology-equivalent of driving a supercar slowly around a small town on a Friday night. Technology companies don't give up that easily, though.

Which brings us to 2015's IFA show in Berlin, where many of the next generation smartwatches have been revealed. What won't surprise most is that all of 2014's big name smartwatches have been given an update, with Samsung, LG and Motorola each exhibiting new versions of their best sellers. There have been a few new names to however..

Arguably the best smartwatch of 2015, LG's G Watch R has had the much anticipated 'Urbane' makeover, turning the somewhat tacky rubber exterior into one of refined metal. If that's not enough, maybe the 'Urbane Luxe' would suit one's tastes more, with its 24 karat gold and er, alligator straps. Be quick, though, as only 500 are being made available at $1200 each....

Samsung's Gear watches live on with the Gear S2 flagship. It's still not actually an Android Wear watch, however, as it runs Tizen, but at least it now works with Android devices other than Samsung's own. Design wise, the UI takes on a more familiar, Apple-esque look, though now uses a rotatable bezel for navigation. It's also totally round, like a watch, and comes in two designs, the regular S2 and the Classic S2, a less techy-design that can use regular leather watch straps.

Motorola's highly regarded 360 also comes round again (sorry, couldn't resist) with a dual-sized second generation device. To look at, it's much the same, and yes, it still has the flat tire at the bottom to house the technology, but inside it is more powerful, with a faster snapdragon 400 CPU, offering more speed and a longer battery (though still only two days). The device is slimmer, and now works with standard straps, and is joined by a 42mm version, presumably for daintier wrists, and a sports one that adds GPS.

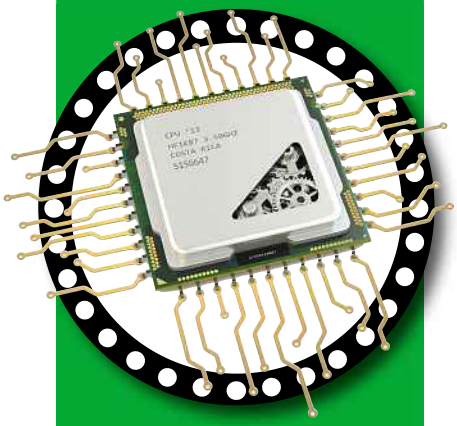
Joining the smartwatch party is budget stalwart Huawei, but surprisingly it's not with a budget device, but a pretty high-end one instead. Straight off the bat, the obviously-named Huawei Watch impresses with a 400x400 pixel AMOLED screen, making it the sharpest in the pack. Beyond this the watch is running Android Wear and has the usual water resistance, heart rate monitor and such. Battery is a bit lacking at a day and a half, but it's the design that wins out here, a round screen and nicely machined metal casing and straps. It's not cheap though, starting at around €399 and rising to €699, but we're sure to see a budget version soon enough.

The market for smartwatches is still unpredictable, with even the Apple Watch failing to really gain a foothold. Mostly this is down to price and lack of a good reason to own, with design and battery power also playing a part. Though moves like making Android Wear watches work with Google's apps on the iOS platform (not iOS itself, though) will help, the real breakthrough may well be a good watch at an impulse buy price of around £49. The market is still to new for this, though, and we've seen no sign of that yet.

2016 may well see the same slow moving smartwatch market, but there's hope that in 12 months time, the smartwatch market may finally get its Moto G, and really kick things off.

Mobile

TomTom Keeps On Truckin'



Drive a commercial vehicle? Andrew Unsworth has found a satnav tailor-made for you

I've never been a truck driver, but I've got a lot of respect for them. Not only do they face the same problems as the rest of us, such as traffic jams and fainting at the price of a service station burger, they also contend with powerful crosswinds, woefully narrow and potholed roads and low bridges.

That last hazard is regularly brought to mind because I have to pass through a couple of low bridges on my way to work, and one particular bridge is always littered with crash debris where van drivers have given their Transits a makeshift sunroof conversion. To be fair, you can't see that this particular bridge is shockingly low until it's too late, and once you've approached it there's very little chance of reversing away from it on account of it being a busy, single lane road. Having reluctantly driven a tall van from London to Newcastle and back, I can fully understand how it's perilously easy to find yourself on the wrong road for your vehicle.

Thankfully, there are satnavs that are designed specifically for trucks, vans and other commercial vehicles. One such example being the TomTom Trucker 5000, news of which recently dropped into my inbox. The Trucker 5000 lets you specify the type of vehicle you're driving, and then calculates the best route for that vehicle before displaying it on its 5" screen (a 6" version is also available). As can be seen from the image below, the Trucker 5000 also asks users to specify the length, width and height of the vehicle, as well as weight, axle load and top speed. According to TomTom, the Trucker 5000 also takes traffic into account when calculating an estimated time of arrival and, having used TomTom satnavs in the past and found them to be pretty reliable when estimating time of arrival, I've no reason to doubt this claim.

> **"Handy for identifying potential accident blackspots, and keeping your license"**

The Trucker 5000 also lets drivers know speed limits and the placement of speed cameras too. That will be handy for identifying potential accident blackspots, and probably for keeping your license, too.

Like other TomTom satnavs, the Trucker 5000 is controlled like a tablet or phone, with users pinching, swiping and pressing buttons to make things happen on screen. TomTom says owners will receive updated maps four times per year for the lifetime of their device, although in the press release "lifetime" is defined as "the useful life of the devices, which means the period of time that TomTom continued to support the device with software updates, content or accessories."

The Trucker 5000 can already be ordered from the TomTom website, but should be available from regular shops come mid-September, which is, conveniently, when this column hits the shops too. Recommended retail prices are, we're told, £280 for the 5" Trucker 5000 and £320 for the 6" Trucker 6000.

Andrew Unsworth has been writing about technology for several years, he's handy with a spanner, and his handshaking skills are second to none

Ryan Lambie has loved videogames since he first stared up in awe at a *Galaxian* arcade cabinet in his local chip shop. 28 years on, Ryan writes about gaming for Micro Mart. He's still addicted to chips and still useless at *Galaxian*

London's Calling

As well as relocating the action to Victorian London, Assassin's Creed: Syndicate will introduce a female co-star, Evie, who specialises in stealth and invisibility

This week, Ryan takes a look at the new characters in Assassin's Creed: Syndicate, and checks out MMORPG Wildstar's move to free-to-play...

Plug & Play

There was once a time when Ubisoft dismissed the idea of a Victorian era *Assassin's Creed* as being "too obvious." But this autumn, 19th century London is exactly where the long-running stealth franchise is heading – to the era of iron, steam, cobbled streets and smog.

That Ubisoft invests an extraordinary amount of time and money in capturing the scale and texture of historical landscape has become a given by now. But watching the new trailer for *Assassin's Creed: Syndicate* (**youtu.be/cKCZHS07kGs**), it really is striking just how much effort has gone into the game's recreation of a long-gone London; sun streams through the glass and iron of a sprawling train station. Gaslights flicker among the foggy streets of Whitechapel. It may be a backdrop for yet more stealth, slaughter and item collecting, but what a backdrop it is.

While the *Assassin's Creed* formula remains largely untouched in *Syndicate*, Ubisoft is throwing quite a few new ideas into the mix. The first is that you'll have two assassin characters to choose from: brother and sister Jacob and Evie Frye. Evie's presence goes some way to addressing the controversy surrounding the lack of playable female characters in *Assassin's Creed: Unity* – an omission Ubisoft rather weakly put down to the "reality of production" last year.

Evie is more than just an alternate character model, however; where Jacob has a tendency to wade into a fight head on, Evie's more into tactics and stealth. One of the tools at Evie's disposal has provoked a mixed response so far: she can make herself invisible. It's a surprising inclusion in a series that has, sci-fi elements aside, largely been about interacting with a world that feels physical and real. If you can simply breeze past non-player characters like Frodo in *Lord Of The Rings*, won't that remove some of the tension, not to mention challenge? The introduction of a heroine, the Victorian setting and hint of the supernatural might also bring *Syndicate* a little too close to another action stealth franchise: Bethesda's *Dishonored*.

These misgivings aside, there's lots to look forward to in *Syndicate*. The aim this time is to unite the various boroughs of London against the Templars, which means heading to different parts of the city and wresting control of them from the villains. It's a concept that could freshen up the franchise's established template of exterminating famous historical figures.

On the subject of historical figures, *Syndicate* will, true to form, have plenty of famous names from the past walking its streets. Chief among them are two famous men named Charles: evolutionary theorist Charles Darwin and novelist Charles Dickens. Because this is an *Assassin's Creed* game, don't expect to see either of them sitting at a desk; if the franchise has taught us anything, it's that history's greatest movers and shakers were all involved in one huge, knotty conspiracy.

Assassin's Creed: Syndicate is out on 23rd October.

Online

It's a pattern we've seen many times over the past few years. An MMORPG is announced

Carbine's Wildstar received some glowing reviews when it launched last year. With a move to free-to-play at the end of the month, it could grow its audience considerably

with much media fanfare, and it enjoys a spike of interest over its first few months. But then, about a year later, it's announced that the MMO is to switch from subscriptions to a free-to-play business model. *Star Wars: The Old Republic*, *EverQuest* and *Dungeons & Dragons Online* are just a few examples of this, and in some cases – particularly *Lord Of The Rings Online* – the shift can have a revitalising effect.

To that list we can now add *Wildstar*, the sci-fi MMO launched in June last year. Created by Carbine, a studio set up by former Blizzard employees, *Wildstar* is an RPG very much in the spirit of *World Of Warcraft*: it's colourful, immersive and surprisingly deep; depending on which career path you take, the game unfolds in wildly varying ways. For the warlike there's the Soldier path; the more laid-back and inquisitive can choose to be Scientists or Explorers.

As you've probably gathered by now, Carbine is set to shift *Wildstar* to a free-to-play model – a changeover that will take place on 29th September. Inevitably, the switch will require a certain amount of retooling and rebalancing, but Carbine says that its forthcoming update will offer far more than a "business model conversion." There'll also be additional content and improvements to the game systems already in place.

"Titled *WildStar Reloaded*, the upcoming content update is the culmination of months of improvements and tweaks that make the game bigger and better than ever," reads a statement from the game's publisher, NCSoft. "New players will enjoy a greatly streamlined starting experience, while veteran players will be handsomely rewarded for their loyalty. As an added perk, all players with active subscriptions at the time of the free-to-play transition will also receive exclusive items as a bonus."

Ahead of its launch later this month, Carbine is currently testing out the free-to-play version of *Wildstar* with a closed beta – all the better, it's said, to "ensure the economic aspects of the free to play transition are launch ready." Those who are already subscribers to *Wildstar* have been part of this pre-release test.

So how will *Wildstar* make money under its new free-to-play guise? The plan is to give F2P players access to all aspects of the game, albeit with a few restrictions, such as the number of character slots they can have open at any one time. Those who stump up for the game's Signature program, on the other hand, will enjoy a range of additional perks, such as the ability to create guilds and Warparties.

Moving a game to free-to-play is always a tricky proposition, but Carbine could be in a good position with *Wildstar*. The game received its share of acclaim at launch last year; a well-balanced F2P version could encourage a sizeable new audience to give *Wildstar* a try.

You can find out more at **www.wildstar-online.com**.

Incoming

After months of anticipation and hype, *Star Wars: Battlefront* is almost with us. And ahead of its release in November, EA has announced that its beta will be held in "early October" for PC and consoles. Those who get to participate will be able to test drive its numerous modes, including its Survival Missions and 40-player online battles.

The clamour surrounding *Battlefront* is such that EA has even taken the unusual step of warning against fake sites offering access to its beta. "Do not be fooled by fake beta sign-up sites," the company's community manager Matthew Everett recently wrote on Reddit. "Our beta registration will live on our official site."

It isn't yet clear how the selection process for the *Battlefront* beta will work, but it's thought that keys will be open to all players, not just those who've preordered a copy of the finished game.

You can keep an eye out for updates at **starwars.ea.com**. *Star Wars: Battlefront* launches on 20th November.

Open beta, this is. Star Wars: Battlefront's beta phase begins in October, with the finished game due for launch on 20th November

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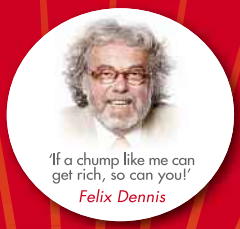

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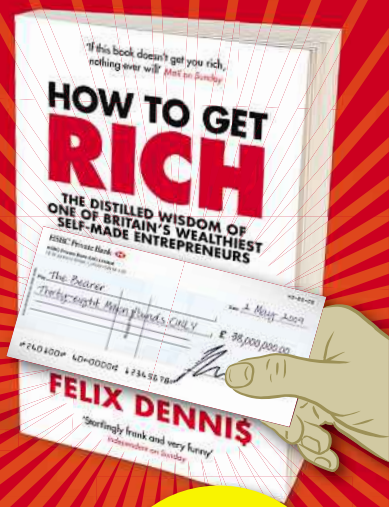

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www.felixdennis.com

'WISE, FEARLESSLY FRANK AND TRULY INSPIRATIONAL'
Mail on Sunday

FREE Private Classified Adverts

1 ONLINE

Visit our website, register and submit your classified advert at www.micromart.co.uk

Your advert will not only appear in our magazine, but be live on our website too!

2 POST

Simply fill in the form & post to:

Emma Corbett, Micro Mart, 30 Cleveland Street, W1T 4JD ◀ **NEW ADDRESS!**

Step 1

Write the wording for your advert in the numbered boxes below (one word each box). Maximum 30 words free.
Please complete in BLOCK CAPITAL LETTERS, then proceed to Step 2

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60

30 Words FREE Private Ads Only (Trade ads MUST be boxed or reversed)	Boxed		Reversed	
	Private	Trade	Private	Trade
	£6.80	£13.60	£8.00	£16.00
£1.70	£8.50	£17.00	£9.70	£19.40
£3.40	£10.20	£20.40	£11.40	£22.80
£5.10	£11.90	£23.80	£13.10	£26.20
£6.80	£13.60	£27.20	£14.80	£29.60
£8.50	£15.30	£30.60	£16.50	£33.00
£10.20	£17.00	£34.00	£18.20	£36.40

Step 2

Choose a category you would like your advert to appear in and tick the box.

- ☐ Hardware for sale
- ☐ Software for sale
- ☐ General for sale
- ☐ Accessories
- ☐ Hardware wanted
- ☐ Software wanted
- ☐ General wanted

Step 3

Complete all fields of your personal details and payment method.

Name

Address

Post Code

Landline Telephone No.

Email

If I have more than 30 words, I have enclosed due payment. I am not advertising pirated, pornographic or any other kind of illegal software and my advert is both honest and legitimate. MM reserves the right to refuse or alter adverts at the discretion of the management. MM cannot be held responsible for the condition or quality of goods advertised. Your advert will be processed on receipt and will appear a.s.a.p. subject to space and availability.

Please tick appropriately ☐ Private ☐ Trade

I enclose payment by ☐ Cheque ☐ Postal order

or please Debit my Mastercard/Visa/Amex account No

Expiry Date:

Authorise payment for £

3 FAX this completed form to: 0207 907 6066

Please Note: The standard Micro Mart conditions of advertising acceptance apply to all classified advertisements. Cancellations and amendments are not accepted to free ads. The publishers may refuse any advertisements and cannot guarantee insertion into any specific issue. Dennis Publishing will use your information for administration and analysis. We may share your information with carefully selected 3rd parties. We, or they, may send you details of other goods or services which may be of interest to you. The information may be provided by letter, telephone or other reasonable means of communication. If you do not want your details to be shared with carefully selected 3rd parties, please tick here. ☐

IT Essentials

TO ADVERTISE CALL
JOE TEAL
0207 907 6689
joe_teal@dennis.co.uk

FILCO
The best keyboards in the world.
Available from
www.keyboardco.com
0845 205 5555

Today's news today, not a week later
- Breaking IT news
- News that matters to UK IT decision makers
- Updated throughout the day

ITPRO FIT FOR BUSINESS

www.bit-tech.net
THE LEADING DESTINATION FOR PC ENTHUSIASTS & HARDCORE GAMERS
bit-tech.net

Amber Transforming young lives

Amber *transforms lives* by offering a fresh start to unemployed, homeless young people seeking direction in life.

Amber *builds* confidence, motivation and self-belief.

Amber *works*

To donate text AMBR03 to 70070 and the amount

or go to **www.amberweb.org**

Registered charity number 1051388

To place an ad in our classifieds, simply fill in the form at www.micromart.co.uk or send your ad by post to Maaya Mistry, Micro Mart, Dennis Publishing, 30 Cleveland Street, W1T 4JD

HARDWARE FOR SALE

Have you got any old kit lying around you'd like to get rid of? Fancy making a few pounds while you're at it? Why not advertise in the Micro Mart classifieds? It's easy and it's free, just email what you've got, how much you'd like for it, and your contact details to micromart-classifieds@gmail.com, and we'll do the rest. There are thousands of readers out there looking for components every week, and you may have something unwanted they've been searching for – so get in touch and save your kit from going to the tip!

Dell Latitude Laptop E5421 i5 (very fast). 4gb ram, 160 gb Hard drive DVDRW fantastic condition. Cheaper than any on Ebay. Very good battery life. You can collect from Manchester or Portsmouth or I can courier out to you next day for an extra £10. Please call or email for any questions. It has Windows 7 64 bit installed and activated with a genuine certificate of authenticity ONLY £110 please add £10 for delivery.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Dell ULTRASHARP U2913WMT 29" SUPERWIDE MONITOR FOR SALE. VERY GOOD CONDITION NO SCRATCHES OR DEAD PIXELS, SELLING DUE TO UPGRADE TO 4K! LOVELY IPS SCREEN. Original Box with cables/stand £280. Paypal or cheque accepted.
Email: llew.lion@googlemail.com

Acer Aspire 1670 laptop. No hard disc. Otherwise in excellent condition. In laptop bag. £45.
Tel: David (07901) 994958

Gigabyte Geforce GTX680. Model GV-N680D5-2GD-B, 2048MB RAM, PCIe x16, bare card, no box. £200 ono. Collection only from Wokingham RG41.
Tel: Bob Pratt (01189) 781753
Email: bob@docbobs.com

HP 88 Inkjet Cartridges eight time expired boxed HP cartridges £5.
Tel: Ian (01932) 856971
Email: a2345@btinternet.com

2 x 2GB OCZ Gold Series DDR2 RAM. PC2 8500, (matched pair) P/N OCZ2G10664GK 5-6-6 2.1v Removed from my working machine. £40 the pair incl. reg. post.
Tel: Dave (01206) 298773
Email: ochdgh@aol.com

MOTHERBOARD + RAM + GRAPHIC CARD BUNDLE. Asus P5QL SE + OCZ 4Gb RAM + 1Gb Quadro PCI-E Graphic Card. SEE SEPARATE ADS FOR DETAIL. From my Windows 8 machine. BUNDLE: £105 Incl. Reg. P&P
Tel: Dave (01206) 298773
Email: ochdgh@aol.com

2 x 2GB OCZ Gold Series DDR2 RAM. PC2 8500, (matched pair) P/N OCZ2G10664GK 5-6-6 2.1v. Has been removed from my working machine. £40 the pair incl. reg. post.
Tel: Dave (01206) 298773
Email: ochdgh@aol.com

NVidia Quadro 600 GPU. 1GB DDR3, Dual link DVI-I + Display port. Max. Display at 60Hz + 2560x1600, Direct X 11, Open GL 4.4. The best per watt in its class. Big performance, small form factor, small power consumption. From my working Win8 PC. £32.50 inc Reg. post.
Tel: Dave (01206) 298773
Email: ochdgh@aol.com

Asus P5QLSE ATX motherboard. LGA 775/Socket T, P43 chipset, DDR2 SDRAM, FSB 1600MHz. I/O Backplate + Driver Disk + User Guide. Rock solid board removed from my working machine. £39.50 to include reg. UK postage.
Tel: Dave (01206) 298773
Email: ochdgh@aol.com

Asus P5QL SE + OCZ 4Gb RAM + 1Gb Quadro PCI-E Graphic Card. SEE SEPARATE ADS FOR DETAIL. Removed from my Windows 8 machine. BUNDLE PRICE £105 Incl. Reg. P&P
Tel: Dave (01206) 298773
Email: ochdgh@aol.com

NVidia Quadro 600 GPU. 1GB DDR3, Dual link DVI-I + Display port. Max. Display at 60Hz + 2560x1600, Direct X 11, Open GL 4.4. The best graphics performance per watt in its class. Big performance, small form factor, and small power consumption. Removed from my working Win 8 machine. £32.50 incl. Reg. post.
Tel: Dave (01206) 298773
Email: ochdgh@aol.com

Dell XPS12 Ultrabook. 4th gen i5, 4GB RAM, 128GB SSD 10 point touch 12.5" 1920 x 1080 Display, Backlit US Keyboard, Wireless-AC, Bluetooth, USB3. £395
Tel: Ian (01932) 856971
Email: a2345@btinternet.com

NON ECC LOW DENSITY LAPTOP MEMORY MODULES. DOUBLE SIDED RAM. Working Laptop pull, Please double check as No returns due to incompatibility. 8GB 2 X 4GB Crucial 204 Pin SODIMM 512Mx64 DDR. CT51264BC1067.M16FD BV1111Z.FS 201106 SU £27.50 the pair incl. Reg. p&p
Tel: Dave (01206) 298773
Email: ochdgh@aol.com

Laptop for sale. HP NC 6400 Core 2 DUO 2.0MHz 3GB ram 80GB HDD, DVDCDRW Fingerprint reader, Fantastic and fast . Windows 7 32-bit professional. Only £60 plus £12 for next day delivery.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Desktop PC. Zalman T3 case, 3.4Ghz CPU, Asus Motherboard, Seagate 500gb HDD, Samsung Optical drive. 4gb Kingston RAM Wifi & Ethernet,Genuine Windows 7 Ultimate. Collection preferred from Flintshire or willing to discuss options. £150.
Tel: Paul (07900) 796780
Email n-peckdd@5kid5.net

Dell Latitude E5420 i5. Very fast 2.5, 4GB RAM, 500GB HDD, DVDRW fantastic condition. Cheaper than any on Ebay. Very good battery life. You can collect from Manchester or Portsmouth or I can courier out to you next day for an extra £10. Please call all email for any questions. It has Windows 7 64 bit installed and activated with a genuine certificate of authenticity. NEW £125.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Compaq/HP nc6320 Laptop. Core 2 Duo 1.8mhz, 512 Ram, 80gb Hard drive DVDRW Win 7 Professional COA. Memory can be upgraded for an extra charge. Cheaper than any on Ebay. Very good battery life. You can collect from Manchester or Portsmouth or I can courier out to you next day for an extra £10. Please call all email for any questions. It has Windows 7 32 bit installed and activated with a genuine certificate of authenticity. Refurbished £60.
Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

Asus Z97 Gryphon Armor Kit. Steel backplate with plastic top and auxilliary fan. Also some minor plastic bits. £20. Email for more details.
Email: graham_rocknell@yahoo.co.uk

Dell D830 laptop. Core 2 Duo T8300 2.4mhz (very fast) 2gb ram 120GB HDD, DVDRW Genuine Win 7 pro 32-bit activated. Fantastic condition. Cheaper than any on Ebay. Very good battery life. You can collect from Manchester or Portsmouth or I can courier out to you next day for £10. Call/email with questions. Refurbished £80.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Compaq/HP 6910p Laptop. Core 2 Duo 1.8mhz, 2gb Ram, 160gb Hard drive DVDCDRW Win 7 Professional COA. Cheaper than any on Ebay. Very good battery life. You can collect from Manchester or Portsmouth or I can courier out to you next day for an extra £10. Call or email any questions. It has Win 7 32-bit installed and activated with a genuine COA. Refurbished £60.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

PC Desktop Ram (DIMM) Memory. Siemens PC100 - 222- 620 16M x 64 SDRAM. HYS64V16222GU-8 Only £8.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

27" iMac. 2.9 GHz Intel i5, 1TB HDD, 8GB RAM – late 2012 Model (thin edge) iMac in good condition, running OSX Yosemite. No keyboard or mouse. Supplied in original box. £700.
Tel: Chris Salter (01707) 880251
Email: ChrisSalter@hoarelea.com

ASUS P5QL-EPU Motherboard - 775 Socket - DDR2. Tested and removed from a working environment, comes with I/O Plate. £45 inc Free Courier. Payment via PayPal.
Email: info@jmcomputing.info

ANTEC 2800 MIDI-TOWER. Black Antec case, Sempron 2800+, Gigabyte m/board, 2GB RAM, 80GB Hard-Drive, DVD-RW, 10/100 Network. Clean install of Windows XP, Office 2007, fully updated & activated, all usual utilities, XP COA on case. £39 (P&P £15).
Tel: Pat (07710) 348638
Email: pat4cars@aol.com

OPTERON 185 WORKSTATION. 2.6GHz Dual-Core, Freezer 64, 4GB RAM, 160 + 300GB, CD-RW, DVD-RW, Floppy, network Card, Soundblaster , NVidea , Vista Business, fully updated & activated, with copy of install media & working activation number. £79 (P&P £15).
Tel: Pat (07710) 348638
Email: pat4cars@aol.com

WD 500GB external USB HDD for sale. Excellent Condition. £20 inc. P&P.
Tel: Michael Cunnane (01452) 303732

KINGSTON 120GB SOLID STATE HARD DRIVE. For sale 120GB Kingston solid state hard drive model SSDnow V300 2.5" Sata3 - compatible with Sata2. Very fast drive. Perfect condition. Free delivery. PayPal accepted. Price £38.
Email: geofry@tiscali.co.uk

Laptop for sale. Dell Latitude E5420 i5 2.5 ghz, 4GB RAM, 500GB hard drive, DVDRW, built in camera. Genuine Windows 7 64 bit professional. Only £150 plus £12 for next day delivery. Payment via Paypal or cheque or bank transfer, cash. Fantastic condition very fast.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Laptop for sale. HP Compaq 6910p Core 2 DUO T7300 2.0mhz 3gb ram 80gb hard drive DVDCDRW Fingerprint reader fantastic and fast , Genuine win 7 35 bit professional Only £60 plus £12 for next day delivery. Fantastic condition, very fast.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

PC Desktop RAM (DIMM) . 64MB Siemens PC100-322-620 MT8LSDT864AG-10CZ5. £8.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

WD 3TB internal Hard Drive. Excellent Condition, £65 inc P&P.
Tel: Michael Cunnane (01452) 303732

Netgear DG834N Rangemax Next Wireless N Modem Router kit. Excellent condition complete with power supply, network cables, telephone cable, ADSL filter and setup CD. £10.
Tel: David Ewles (01295) 253554
Email: david@ewles.gb.com

WD Internal SATA 3.5" 2TB Hard Drive. Excellent Condition. £37.50 included P&P. Flat screen monitors. Mainly 15" £20+p&p and 17" £30+p&p but have others on request. When packing I will make sure they have lot of padding to reduce rick of damage. Please email or call me for more information.
Tel: David (01616) 888119
Email: pcmadnessltd@yahoo.co.uk

IBM Thinkpad T30 laptop for spares or repairs. Excellent condition, but does not bootup. Not sure why. Could be an easy fix or for parts/spares.
£15 plus P&P.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

Webcam (Trust Spacecam). Boxed with CD of installation software and instruction manual. Perfect condition. £10.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

For Sale: HP Photosmart C4585 All-in-One multifunction colour printer. Perfect condition. Includes software discs and manual. £20
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

Western Digital Cavier SE Desktop Hard Disk Drive 160GB. In Perfect condition. Only £10
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

Asus A8V motherboard, socket 939. Clips holding CPU cooler broke, CPU overheated & shut down. M/B should be OK and there is 4GB of ram on board. Free, collect only. North Wales.
Tel: (01286) 678584
Email: gw7hav@googlemail.com

Toshiba Portage i5 laptop. 2.5GHz Model R830-13c 4GB RAM, 320GB HDD. Wi-Fi, fingerprint scanner, HDMI ouput. Sold on eBay for over £200; only £150 plus £15 p&p. Bargain. Great condition, and a very light device.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Seagate Barraucda 250GB SATA Hard Drive 3.5". Tested and removed from a working environment. £12 inc Free Courier. Payment via PayPal.
Email: info@jmcomputing.info

LAPTOP HARD DRIVE. 160GB SATA 2.5". WESTERN DIGITAL. Model: WD1600BEVT. Fully tested. Perfect working order. Partitioned and formatted NTFS. Free postage. Price £22. Paypal accepted.
Email: geofry@tiscali.co.uk

DESKTOP HARD DRIVE. 640GB Western Digital 3.5" SATA model WD6400AAKS. Perfect working order. Partitioned and formatted. Only used as back-up drive. Free delivery. Price: £33. PayPal accepted.
Email: geofry@tiscali.co.uk

4x 1 GB DDR2 RAM (Ocz Nvidia SLI PC2 6400 epp 4-4-4-15) for Sale. £40.00 for all 4 + Post/ Packing. In perfect working order.
Email: ken.toole1@virginmedia.com

Vintage Amstrad PC1512 HD20. Colour Monitor 20MB Hard Drive 5.25 Floppy Original Amstrad Disks Manuals spare Keyboard and Mouse. This is a rare fully functioning collectable. £60.
Tel: (01949) 876235
Email: hc4203@gmail.com

4x 1GB DDR2 Ram (OCZ Nvidia SLI PC2 6400 epp 4-4-4-15). £40.00 for all 4 + Post/ Packing. Perfect working order.
Email: ken.toole1@virginmedia.com

Laptop Hard Disk Drive. Fujitsu. 20GB. Excellent condition: £10.00.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

XFX GeForce Nvidia 8800Gts Graphics Card For Sale. £40.00 + Post. In perfect working order
Email: ken.toole1@virginmedia.com

Corsair Vengence 16GB (2x 8GB) DDR3 RAM CMSX16GX3M2A1600C10. Never used. Selling due to wrong voltage, these are 1.5V and I needed 1.35V. Asking £85 inc. postage to the UK.
Email: fabstock1@gmail.com

HP Microserver n40l / windows 7 Pro / 4GB RAM / 400GB drive / MS Office 2003. This HP n40l Microserver is in excellent condition and comes with Windows 7 re-allocated, activated & updated Feb 2015. Also installed is Minitools Partition Magic, MS Office 2003 HP basic, with codes/COAs. Buyer may have Linux Mint, or a completely bare drive. 2 spare drive frames. I have the original packing as per HP original delivery. So far as I can see, this Microserver will take 16GB memory and up to five drives. See it working before buying, (by arrangement). No refund under any circumstances. Collect from Harrogate, North Yorkshire. £140. Cash on collection. Delivery might cost £8 via Hermes, maybe much more to Highlands/Islands. Payment by Cheque OK subject to clearing, Paypal at £25 additional (to cover their fees).
Tel: (07794) 528857
Email: it_central@ntlworld.com

CD Optical Drive for installation in desktop PC Only £10.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

Used Asus Wireless Router for sale. Dual-band 4 x GB Ethernet Wi-Fi RT-N66U N-900. £65.00 O.V.N.O. Selling cause I have no need for it since upgrade to BT Home Hub 5.
Email: beme12355@googlemail.com

SKY PLUS and SKY PLUS HD REMOTEs. Original £7.50 + P&P please email or call me for more information.
Tel: David (01616) 888119 Email: pcmadnessltd@yahoo.co.uk

US Robotics External 56K Message Modem. Includes V.90 56K Standard X2 Technology. Boxed and complete. Perfect. £25 + p&p.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

2 x 2GB DDR3 1600 MHz RAM. Recently taken from a 2012 mac mini. As new £25.
Email amstereofan@gmail.com

Custom Built modified watercooled gaming desktop. i5 4670K, R9 280X, Silverstone RV-01 USB3, 1000W PSU: parachord sleeving, Z87M OC Formula, 8GB Kingston Fury 1866MHz, 180mm and 120mm Radiator. Yellow and Black colour scheme! No Storage. Email for pics and info. Buyer collect: Gloucestershire. £800 ono.
Tel: Adam (07426) 874117 Email: flaming_monkey95@hotmail.co.uk

Kingston HyperX 2x2GB DDR2 1066MHz RAM. Tested and removed from a working environment. £45 inc Free Courier. Payment via PayPal.
Email: info@jmcomputing.info

2x 512MB PC3200 DDR400. Two sticks were removed from working system. £5, plus £1 P&P.
Tel: Alan (02084) 202322
Email: alan@asandco.co.uk

Asus M2N2-SLI Deluxe motherboard bundle. With AMD Athlon 64 4000 CPU, 4GB of Corsair RAM plus fan, backplate, manual and driver CD. £40
Email: david.white38@ntlworld.com

IBM/LENOVO SFF BASEUNIT. P4/ 2.8 H-T, 2GB RAM, 40GB Hard Drive, CD-Rom, 10/100 Network, sound, USB, Clean install XP-pro, fully updated, Office Suite, Anti-Virus, & all usual utilities, COA Licence Sticker & Install media, £25
Tel: Pat (07710) 348638
Email: pat4cars@aol.com

FUJITSU-SIEMENS MINITOWER. Pentium D 2.8 Dual-Core, 2GB RAM, 80GB Hard Drive, DVD-RW, Gigabit, sound, Clean Install XP-pro, fully updated, Office suite, Anti-Virus & usual Utilities, Legal COA sticker & System Image. £35
Tel: Pat (07710) 348638
Email: pat4cars@aol.com

DELL OPTIPLEX GX240 SFF. P4/1.6, 20GB hard Drive, 768MB RAM, CD-Rom, 10/100 network, Sound, Front USB, Clean install XP-pro, fully updated, works OK but slow by modern standards, £15.
Tel: Pat (07710) 348638
Email: pat4cars@aol.com

56kb Fax Modem External. £10.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

LG Flatron W2246S 22" monitor with power and VGA leads. No dead pixels in very good condition. £50 Buyer Collects (Verwood, Dorset)
Tel: (01202) 826057 Email: geoffandcynth@themailspot.com

2x 1GB PC2100-648. These two matched sticks were removed from one of my redundant systems. Plus one PC2700 (DDR 333Mhz) and one 512Mb PC3200 DDR400 stick. All for £5 plus £2 P&P.
Tel: Alan (02084) 202322
Email: alan@asandco.co.uk

Very rare Viking IBM 16MB Dram Card (15109 66G5109) for Compaq, IBM Thinkpad, Etc Laptop Only £20
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

TP-Link 54Mbps 4-port Wireless G Router. Perfect, boxed. Model: TL-WR340G. £20 plus postage.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

Intel Core 2 Duo E4600 3GHz 775 Socket Processor. Tested and removed from a working environment. £10 inc Free Courier. Payment via PayPal.
Email: info@jmcomputing.info

Addon Wireless LAN USB 2.0 54Mbps 802.11g Adaptor. Boxed w/ manual and software: £9.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com
CD Stomper CD/DVD Labelling System: Software, Labels and Label Applicator. Boxed. Unused. £9.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

DIR-615 Wireless N Router. Boxed, brand new. £30.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

2x 120GB Maxtor DiamondPlus 9 Drives plus 1x 80GB DiamondPlus 10. Can be supplied with 2x plug-in caddies. Reasonable offers please.
Tel: Alan (02084) 202322
Email: alan@asandco.co.uk

HP Elitebook 8760w i7 2820QM @ 2.2GHz 32GB RAM 750GB HDD Quadro 4000M GPU. Only 2 small marks on whole machine. Cost £3500 when new. £900 ONO
Tel: (07772) 926632
Email: stedaley19@gmail.com

WD 2TB desktop HDD. Formatted ready for an OS. Runs very nicely. New laptop means desktop items must go! £40 inc. tracked postage.
Tel: (01619) 501218
Email: jmbest2@sky.com

HARDWARE WANTED

Trying to breathe life back into an old machine? Why not submit a wanted ad and see if any of the thousands of computer enthusiasts who read the magazine each week have what you're looking for?

WANTED: Corporate / ex-business PC's and some printers (in working order) required for a registered charity to redeploy to a new primary school in Nigeria. Preferably free or at very low cost. Thank you.
Email: KG_Earl@hotmail.com

WANTED: PC Tower case (beige colour if possible) to rehome an Amiga A1200 vintage computer. The Amiga motherboard is H 410mm x L 190mm (H 16" x L 7.5"). PSU not an issue but if available 250 watt more than enough.
Tel: Bill (07742) 061569 or (02641) 769503.

WANTED: Fractal Design Define XL full tower case. R1 (original version) in black.
Tel: (01670) 860146
Email: mm@tectron.co.uk

SOFTWARE FOR SALE

Do you have old software that you simply don't use? Why not advertise with us?

Microsoft Office 2000 standard. Upgrade retail box only PART NUMBER 021-02661 £15 NEW AND SEALED. This includes the following WORD, EXCEL, OUTLOOK, POWERPOINT. If you need an upgrade path I can supply one for free. Please add £3 for p&p.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Microsoft Project 2000 retail boxed new unopened box. ONLY £20. Includes Microsoft Project Central and server software. Perfect to upgrading to the latest software at a fraction of the cost. Please add £3 for p&p.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Adobe Photoshop Elements and Premiere Elements 12 Full Version - Windows/Mac. Original Boxed CD with unused product key. £47.50
Tel: Ian (01932) 856971
Email: a2345@btinternet.com

PCB design software 127 layers, schematic entry, PCB entry, PCB to Gerber file converter, output to printer. £9.99
Tel: Nigel Wright (07967) 527693
Email: cresswellavenue@talktalk.net

Cyberlink PowerDVD 12 Standard. Runs under Windows 8, 7, Vista or XP. Original CD with unused product key £7.50
Tel: Ian (01932) 856971
Email: a2345@btinternet.com

Microsoft Office 2013. Original Software only £100.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

Sim City 2000. Boxed and original. Classic gaming. £15.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

SOFTWARE WANTED

Wanted: Driver disc for Toshiba L30-11D PSL33E laptop. Laptop useless without drivers but only worth £40, so cannot pay a lot.
Tel: John Udall (01384) 824494
Email john.udall@blueyonder.co.uk

Wanted: PictureToExe software, for making picture shows.
Tel: (01202) 610602
Email: ivor.mary@talktalk.net

Wanted: Quicken 2001 UK Edition. I need to reinstall the program, but have lost my original installation CD.
Email: david.maddams@icloud.com

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ASK AARON

Meet Aaron Birch. He's here to help you with any general upgrading, software and system building problems. He's got advice aplenty, and you're very much welcome to it!

Send your questions to:
Aaron Birch
Micro Mart
Dennis Publishing
30 Cleveland Street
London
W1T 4JD

Contact Aaron by email at:
aaron@micromart.co.uk

Please try to keep your queries brief and limit them to just one question per letter, simply so we can squeeze in as many as we can each week. Please include relevant technical information too.

Aaron

Moving Day

My computer has an SSD for Windows and Programs (120GB) and a spinner for data.

When delivered from Chillblast the whole of Users is on the D drive (spinner). Because of this I can't update from Windows 8 to 8.1 and because of this I can't update to 10. I can't transfer all of D:\Users to the C drive since there isn't room, but thought if I could set up a duplicate \Users and fill with a bit of data then redirect My Documents to the D drive in the approved manner.

I've searched through the registry and found (I think) where Users is defined -

HKEY_LOCAL_MACHINE > SOFTWARE > MICROSOFT > WINDOWSNT > CURRENT_VERSION > ProfileList

In here it states ProfilesDirectory as D:\Users

Unfortunately there are several sub-folders with names starting S-1-5-21-xxxxxxx – seemingly one for each user with

ProfileImagePath entries pointing to D:\Users\UpdatusUser
ProfileImagePath entries pointing to D:\Users\Mike
ProfileImagePath entries pointing to D:\Users\Guest
ProfileImagePath entries pointing to D:\Users\Administrator

If I copy Users back to C (albeit a very slimmed down version with my data saved elsewhere) Then change these entries to things like C:\Users etc. do you think this would work?

Mike

Moving various system-level folders can cause many problems when it comes to updating Windows, especially upgrading to a new version, and this includes the Users folder. A lot of people do the same thing you've done here, Mike, as it's a great way to save space and to organise how you store your files. It is possible to move the folder so you can upgrade, however the procedure is different to how you've been approaching it.

It's actually a little more complex, I'm afraid, but it's not all that difficult. It involves an automation, or unattended script (also called an answer file), which I'll give you here, so be ready to do a fair bit of typing. It also uses Windows' Audit mode.

To kick off you need to boot Windows 8 into Audit Mode. To do this open up a command prompt with admin access. At the prompt, type 'C:\Windows\System32\Sysprep\Sysprep.exe /audit /reboot', assuming your copy of Windows is installed on C. If not, simply change the path. Press Enter and Windows will reboot into Audit Mode. This is a mode that makes Windows think it's booting for the first time. When Windows boots you'll see a basic Metro screen, so go to the Desktop. Here, close the Sysprep window. Next, we need to create the automated file I mentioned earlier.

Open Notepad and type in the following XML script, being sure to note the highlighted sections. The value of processorArchitecture must be "amd64" if you're using a 64-bit version of Windows, even if you're running an Intel CPU. If you're running a 32-bit version of Windows, change this value to "x86" instead.

The line beginning <ProfilesDirectory> is where you want to move the Users directory to which, for you, will be the volume it originally should have been in. In this example the Users folder is going to be on the root of the C drive, which is where you need to move it to if Windows is installed on C.

Finally, the entry for "wim:D:\sources\install.wim#" refers to the version of Windows you're running. It's two-part value, with the install file location preceding the #, and the version, or SKU being upgraded to following it. So, in the below example the location of the install file is D:\sources\install.wim, and the version is Windows 8. You'll need the install media for the OS to be present when you proceed. Here's the script in full.

```
<?xml version="1.0" encoding="utf-8"?>
<unattend xmlns="urn:schemas-microsoft-com:unattend">
<settings pass="oobeSystem">
<component name="Microsoft-Windows-Shell-Setup" processorArchitecture="amd64" publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS" xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<FolderLocations>
<ProfilesDirectory>C:\Users</ProfilesDirectory>
</FolderLocations>
</component>
</settings>
<cpi:offlineImage cpi:source="wim:D:/sources/install.wim#Windows 8" xmlns:cpi="urn:schemas-microsoft-com:cpi" />
</unattend>
```

Once you've typed all of this out, save the file as XML and name it whatever you like. For this example we'll name it Win8UserMove.xml.

Now we have the answer file we need to use it with Sysprep to make the changes. So, open up an admin command prompt again and type 'net stop WMPNetworkSvc' to stop the Windows Media Player Network Sharing Service if it's running.

Next, type 'cd c:\Windows\System32\Sysprep' and press Return (again, assuming Windows is on C), followed by 'Sysprep.exe /audit /

reboot /unattend:C:\Win8UserMove.xml' and press Return (replacing C:\Win8UserMove.xml with your own XML file and path).

If all goes well, Sysprep will pop up, and will execute the instructions from the answer file. Leave the PC alone when this is happening.

Once it's done the PC will reboot and Windows will once again be in Audit Mode. Click Desktop and you'll see Sysprep again. This time make sure the System Cleanup Action is set to OOBE ('Out-Of-Box-Experience', if you were wondering) and Shutdown Options is set to Reboot and click OK.

On booting up you'll be prompted to enter the relevant product key info and to create a new user. Don't worry, your old users are still there, but you will need to create a new one for the purposes of this procedure I'm afraid. Simply create a new, dummy account, and when you can, log in using your normal account. You can, of course, delete the dummy account after should you wish.

You'll now notice that the users folder is located on your specified drive, in your case, back to C, along with all relevant subfolders. You should now be able to upgrade as normal to Windows 8.1 and Windows 10.

An unattended answer file is a way to instruct Windows' system preparation tool to make changes

```
<?xml version="1.0" encoding="UTF-8"?>
<unattend xmlns="urn:schemas-microsoft-com:unattend">
  - <settings pass="oobeSystem">
      - <component language="neutral" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State" versionScope="nonSxS" publicKeyToken="31bf3856ad364e35"
        processorArchitecture="amd64" name="Microsoft-Windows-Shell-Setup">
          - <FolderLocations>
              <ProfilesDirectory>C:\Users</ProfilesDirectory>
            </FolderLocations>
        </component>
    </settings>
    <cpi:offlineImage xmlns:cpi="urn:schemas-microsoft-com:cpi" cpi:source="wim:D:/sources/install.wim#Windows 8.1"/>
</unattend>
```

Another Moving Day

I need to move my User profiles folder in Windows 10 and I've heard there's a way to do this once, which changes all the setting needed in one go so that I can change the location of the folder even though I've already installed Windows 10. I was hoping you could help me with this, as I just don't know what I'm looking for.

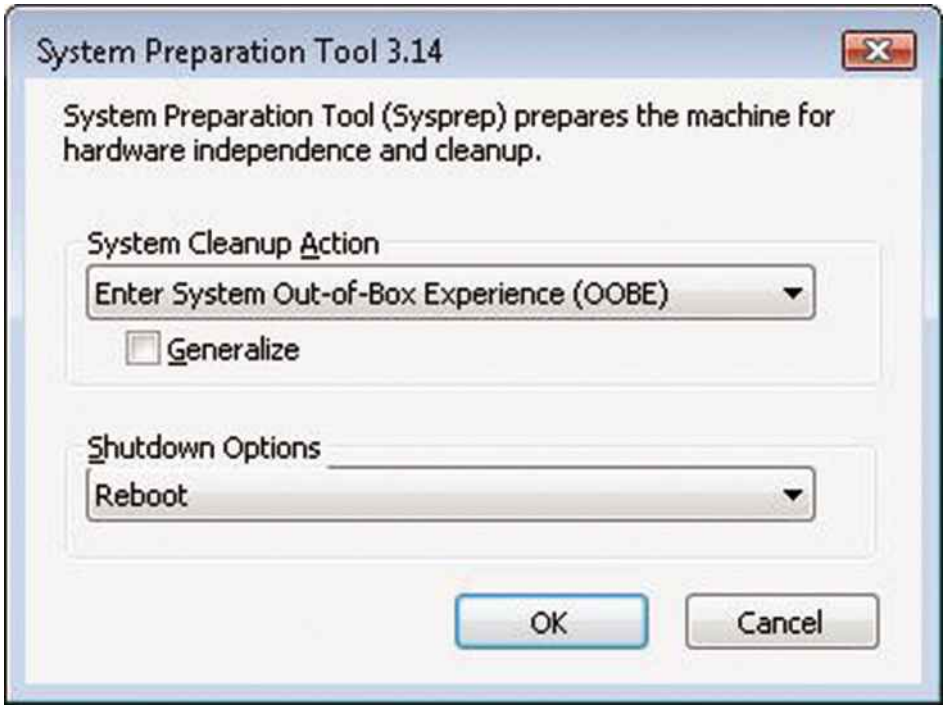
Taylor

This is a very similar question to Mike's, so as we're on a roll with this topic, let's continue shall we? Your procedure will be very similar to the method I described to Mike previously, including the same unattended script, so please refer to the answer I gave him, and recreate the same XML file, obviously making any changes you require for your specific setup.

Once you have this, all you need to do is run Sysprep from the command prompt (admin). Make sure you first type 'net stop wmpnetworksvc' (to stop the WMP Network Sharing, as before) and then type '%windir%\system32\sysprep\sysprep.exe /oobe /reboot /unattend:c:\YOURFILE', where YOURFILE is the location and name of your saved XML answer file. Press Return and Windows will fire up Sysprep. Let it run, leave the PC alone, and wait for it to reboot. When it does, go to the Desktop, ensure the OOBE boot is selected and reboot. You too will have to go through the motions of setting up Windows, creating a dummy account, before then signing in as your normal account.

Your Users folder, however, should now be moved to the new location you specified in the answer file.

Sysprep is a very useful Windows tool that can be used in many ways , including altering aspects of an existing Windows installation



ASK JASON

Meet Jason D'Allison, a veteran of Micro Mart's panel of experts. He's here to help with any technical questions, including anything to do with tablets or smartphones, as well as PCs

Send your questions to:
Jason D'Allison
Micro Mart
Dennis Publishing
30 Cleveland Street
London
W1T 4JD

Contact Jason by email at:
jason@micromart.co.uk

While we try to cover as many questions as we can, we regret that Jason cannot answer your questions personally, but he'll cover as many as he possibly can each week. Please ask one question per letter and remember to include the full specification of your computer, including its operating system.

Jason

Skylake Ahoy!

My gaming rig's a bit long in the tooth and starting to struggle – it's based around a Core i5-750 – so I'm drawing up a list of parts for a new build. I'll probably get a Core i7-6700K, one of the new Skylake jobs, and a motherboard capable of overclocking it. As I understand things, Skylake chips can still use DDR3, not just DDR4, so if I buy a suitable motherboard, am I correct in thinking I could redeploy my current RAM?

George, Gmail

You're more or less correct, yes, George. CPUs for LGA 1151 – the Skylake jobs – have memory controllers that support both DDR4, at 1.2V, and DDR3L, at 1.35V. DDR3L is found mostly in laptops, though. Standard DDR3, for desktops, operates at 1.5V or 1.65V, so with Skylake that's out of the picture.

Or is it? Some motherboard makers have broken Intel's rules and are selling LGA 1151 boards that do actually support standard DDR3 (in addition to DDR3L). Clearly, the Skylake memory controller is designed for a maximum of 1.35V, though, so I'd have thought that pumping 1.5V or 1.65V through it could cause catastrophic damage. Who knows, though? I guess we'll see in the coming months.

Should you go this route? I can see the appeal for someone on a budget who's plumping for a Pentium and low-end motherboard. Carrying over existing RAM could make financial sense at the least, but in your case, George, you're forking out for flagship parts, so why saddle yourself with yesterday's RAM?

The performance advantage from DDR4 is negligible at present, but even so, that's the route to take in my opinion. You can always sell your DDR3 modules to recoup a good chunk of the cost.

➤ Can you use DDR3 with a Skylake CPU?

A DIMM View

Continuing the discussion of DDR4 begun in my reply to George, I should introduce UniDIMM. No, this isn't the head dunce at King's College London. Rather, it's a new RAM standard cooked up by Intel for use in Skylake laptops. The headline feature is that a UniDIMM socket can take either a DDR4 SO-DIMM or a DDR3L SO-DIMM. Sadly, though, these can't be standard modules – they have to be special UniDIMM modules.

The idea is that laptop makers can design Skylake laptops that they can ship with DDR3L for now and with DDR4 once prices drop. Good idea, but no cigar. The special socket and modules no doubt carry a premium, and as standard DDR4 SO-DIMMs already only cost about 20% more than standard DDR3L SO-DIMMs, I reckon most Skylake laptops will simply use standard DDR4 straight out of the gate. For budget machines, manufacturers will probably stick to standard DDR3L for the next year or so and move to standard DDR4 when they release new models.

➤ UniDIMM modules are so rare (or so new) I can't even find a proper picture, so here's a photo I'm naming 'Uni, Dim'

Pin Money

It seems my uncle has had a fiddle inside his PC and broken something. Simply because I know the difference between PCI and PCI-Express I'm deemed to be the family's computer expert, so it's fallen on me to get things working again. Basically, he's tried to insert the DVD writer's IDE cable upside down, and one of the drive's pins is now pushed right in.

The drive works in some situations but in others, such as installing programs, Windows throws up errors. Is this just down to the drive, or has the broken connector caused a short and damaged, say, the motherboard? If I open the drive up, could I pull the pin out? I don't think IDE DVD writers can be bought any more, and the two SATA ports on his PC are used by hard drives.

B. Mulhern, Gmail

I feel your pain, my friend. This is so easily done. Indeed, I've done it myself – more than once! I'm also the family's computer expert, and to be honest that's probably the most painful thing of all. Oh, the weekends I've lost!

Anyway, you might think a missing pin would have no affect at all or else would kill a drive stone dead, but it depends on which pin. Symptoms such as yours aren't uncommon. I very much doubt any secondary damage has been caused. So, find some tweezers and try to pull the pin out (be gentle). It doesn't have to be perfectly straight and it also doesn't have to protrude as far as the other pins. Pins pushed halfway in will still normally make contact with the attached cable.

Of course, there's a chance the pin's actually snapped off from the circuit board. If that's happened, you could probably solder it back on if you've got a steady hand and the required equipment. I've rescued a fair few drives that way.

*If you do end up needing to buy a replacement, though, it's true that new IDE/ATAPI writers are becoming scarcer by the hour, and sadly it's also true there's a price premium over SATA drives these days. Don't panic, though. The best deal I can find is at www.cclonline.com, where a 22× Samsung unit can be bagged for £20 (**goo.gl/BbS1xN**). That compares to about £12 for the equivalent SATA model. A nasty hike, to be sure, but it's unlikely to bring tears to your eyes.*

Remember these?

Back-breaking Stuff

My gorgeous black Sony Xperia Z2 smartphone fell out of my pocket at work and now the glass on the back has smashed. I bought the phone soon after the Z2 was released, so it's only about fifteen months old (I see, unbelievably, that the Z3, Z3+/Z4, and now Z5 have all been released or announced since). I can't see how to take the back off – there are no visible screws – but I assume it must be possible. Could I replace it myself, or is it a job for a professional?

Jonas, Isle of Wight

Replacing the back panel on the Z2 isn't too hard, thankfully. You could certainly do it yourself, Jonas. There are a few tools you'll need – I've included a parts list below – but they won't break the bank. Look on eBay, Amazon, and the like.

Heat gun (1500W+):** about £11.99**
***Suction cup and spudgers:** about 99p*
***Black Z2 back panel with fitted adhesive:** about £3.69*

Run the heat gun around the edges of the broken panel to soften the internal adhesive (don't let the gun touch the phone). Use the suction cup and spudgers to lift and prise the panel off. On the inside of the panel will be a sticker with some copper contacts on it (this makes NFC work). Peel it off and re-affix it to the new panel. Do the same with the grommet over the camera cut-out (otherwise light from the flash will bleed into the lens). Finally, give the glue on the new panel a blast with the heat gun and then press the panel into place.

*If you'd like to see the procedure being performed, watch this short YouTube video: **goo.gl/5K3lXI**. As you'll note, there's nothing to get worried about.*

Bear in mind, though, that your repaired Z2 will probably no longer be waterproof. No doubt it would stand up to the odd splash here and there, but I think you'd be daft to risk full submersion no matter how confident you are in your skills. If that bothers you, your best bet is to have the back panel replaced at a Sony service centre (ouch).

***** *You might be able to get away with using a hairdryer in lieu of this purchase*

Glass backs are lovely right up until the second

Crowdfunding Corner

Disappointed by the headphones you own? Can't find the ones you really want? This week, we've got a pair of headphone projects unlike anything on shelves right now, and which might satisfy your requirements

Batband

The more radical of the two projects, the Batband barely counts as a pair of headphones at all. It describes itself as a "piece of sound technology", which is cover for the fact that it's a pair of speakers which uses bone conduction to get sound into your ear. Worn around the back of the head, it means you can hear the output from your phone or computer without having your ears plugged up, allowing you to hear the world around you as well.

Bluetooth compatibility means that there are no wires to worry about, though the band can be easily recharged from any USB port. There's no software to update either, and controls are activated by touch sensors on the side of the headband, allowing you to answer or end calls, adjust the volume and skip tracks forwards and backwards.

If this sounds like the headphone alternative you want, you can save massively by backing the project on Kickstarter – they'll be retailing for $250 (£162 without shipping) but you can get them with shipping included for just $164 (£106). The project is a third of the way towards its goal, but has over 40 days left to hit its target. It comes from the people who made the successful Ostrich Pillow – so they've got form in bringing Kickstarter products to market, which should give you extra confidence.

URL: kck.st/1UDH0uN
Funding Ends: Wednesday, October 28th 2015

LIVV Headphones

If you live a more active lifestyle – or just want a more conventional pair of headphones – the LIVV headphones might be more up your street. These wireless, over-ear headphones are designed to stay seated on your head no matter what you're doing. They have built-in Bluetooth, a 12-hour rechargeable battery and built-in microphone, as well as onboard controls, removable foam ear pads and a pair of 40mm drivers. What's more: they're waterproof.

If all that still hasn't got you reaching for you credit card, they have 8GB of onboard storage so that you can load them up with tunes and not need to be carrying your phone or tablet. Makes sense, given that they're aimed at sportspeople.

It's safe to say that this is pretty serious equipment, which means it's quite expensive. However, unless the project explodes in the next few days, you should be able to get into one of the early bird tiers and save $100. That still means you'll still be paying $229 with shipping (£148). RRP is $300 (£194) without shipping, though, so there's a fair incentive to buy, and stretch goals of new colours and greater storage are already being chased because the project has surpassed its initial target. You've got until October to back the project, and it'll ship in April 2016.

URL: kck.st/1L49iE0
Funding Ends: Thursday, October 1st 2015

Disclaimer: Images shown may be prototypes and Micro Mart does not formally endorse or guarantee any of the projects listed. Back them at your own risk!

App Of The Week

VariDesk App

Stand up, and improve your health

The slogan of this week's app is 'Stand up for a healthier life', which is not all that suprising considering it comes from VariDesk, a company that manufactures and sells its own riser desk units that sit atop an existing desk, allowing you to raise the height of your workstation so you're standing while working. While it's easy to see this as a health fad, we had the pleasure of reviewing the VariDesk Pro Plus 36 last week, and it was a fantastic addition to our desktops. Not only does it make a nice change, it can help to correct posture and burn off a few extra calories at the same time.

The Benefits

Before we look at the app itself, let's have a quick review of the benefits that standing at your desk rather than sitting at it for hours on end. According to research, using a standing desk during a standard nine-to-five day will burn of an extra 300 calories; totting up to 1,500 calories per week. There are a number of ailments linked to sitting at a desk throughout the day, too: back pain, weight gain, a mid-afternoon slump of your metabolic rate, and a low feeling in oneself.

Standing up throughout the day, however, is said to help alleviate these conditions by forcing a better posture, taking care of those extra calories, increasing your energy levels and helping your metabolic rate improve.

The App

Together with the VariDesk unit, the app will help you maintain the best of both sitting and standing positions throughout the course of the day. The key here is to best utilise the functionality of the VariDesk, by setting timers to indicate when you stand and when you should sit for a certain length of time.

By default, the time is set to forty two minutes of standing and forty minutes of sitting, which gives you a balanced approach to the day without tiring you out unnecessarily to begin with. As you become used to standing up, you can further increase the time on your feet and lessen the time sat on your bum.

In addition to the timings and alerts for when you have to change, there's also a calorie counter to estimate how much you've burned over the course of the day.

Features At A Glance

- Free
- Customised timer for standing and sitting times
- Alarms for when you need to swap positions
- Calorie counter

Does It Work?

We've been using the VariDesk Pro Plus 36 along with the app for a couple of weeks' now, and in all honesty we can happily say that we do feel a little better for it. Although we try and adopt a good posture, we often find ourselves dipping and slouching before catching ourselves and sitting upright again. With the Pro Plus 36 and the app reminding us throughout the first few days, we gradually got used to standing up and improving our niggling back ache at the end of the day, as well as an ache in the back of our legs.

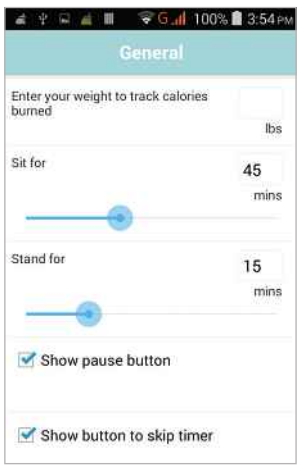
Now we stand up for the entire day, and it is having a more positive effect on our health. We can't run a marathon just yet, but there's a definite improvement. And, if this is a part of the standing up benefit, we get to sleep faster and feel more refreshed the following day too.

Conclusion

The app is useful for the first week or so as you get used to standing up. After that, you'll probably not use it again as you'll be on your feet all day. However, for the time and with the VariDesk Pro Plus riser, it's an excellent combination to get you feeling better about yourself and improving your posture and energy levels.

Set the alarm to alert you when it's time to sit...

...Or to stand



The customised timer allows you to increase standing time as you get used to it

Logging Off

Not sure if my inner Victor Meldrew is coming to the surface, but recently I've started to notice when news channel journalists make entirely wild generalisations. I've heard 'Everyone is on Facebook' at least twice, 'on everyone's twitter feed', and even how anyone technically minded will be excited to 'hear what Apple plans next'!

Really? I'm not so sure; though such expectations are not auniquely British phenomena. Technical podcasts from the US seem to regularly feature people who genuinely believe that *everyone* in the Western world has an Apple iPhone, or that *all* journalists own a MacBook Pro.

Sorry to stick a pin in that balloon, but I don't own either, and lots of journalists I know don't fit into that rigid perspective either. Neither do I don't use Facebook, snapchat or Twitter. That alone proves there's a huge danger in boldly stating 'everyone' does something, just because you do that thing.

What such generalisations reveal is that, because the world is so connected, we've come to assume that – despite our ethnic, cultural and geographic differences – everyone has the same lifestyle and interests too. What's fascinating is that there is strong evidence that there are differences, and they're actually revealed by trends in what technology sells well or badly in specific regions.

For example, in Asia flip-phones are still massive sellers, where they stopped being hip in the west not long after Neo threw his in the trash in *The Matrix*. Equally, Apple sells very well into the US market, but very poorly in South America, as it's not prepared to adjust its pricing for that region. Oddly, Brazil is one of the few places where Windows mobile is strong, where it's died a horrible death in Microsoft's own home market.

In some situations it's down to the local levels of disposable income and how these don't fit with the cost of some brands, but there are also cultural differences too. For example, technologies that rely on infrastructure can fail to sell well if that doesn't exist.

One interesting aspects of this is that, according to researchers, there are two distinctly different cultures in regard to technology adaption. Some countries are focused on individuality and others on collectivism, and this can impact on the adoption of new technology. Where in one culture people do their own research and decide what's best for them, in others straying from what others are doing is considered as a negative trait and something not to be encouraged.

EDITORIAL
Editor: Anthony Enticknap
theeditor@micromart.co.uk
Designer: Laura Jane Gunnion
Designer: Kevin Kamal
Bonus John: John Moore
Contributors: Mark Pickavance, Jason D'Allison, Joe Lavery, Sven Harvey, Simon Brew, Dave Edwards, Ryan Lambie, James Hunt, Mark Oakley, Roland Waddilove, Paella, Scotch pancakes, Sausages, Sarah Dobbs, David Hayward, Michael Fereday, Ian McGurren, Aaron Birch, David Briddock, Ian Marks, Craig Grannell, Kevin Pocock, Andrew Unsworth, Keir Thomas

Caricatures: Cheryl Lillie

ADVERTISING
Group Ad Manager:
Andrea Mason
andrea_mason@dennis.co.uk

Sales Executive:
Joe Teal
Tel: 0207 907 6689
joe_teal@dennis.co.uk

US Advertising Manager
Matthew Sullivan-Pond
matthew_sullivan@dennis.co.uk

MARKETING
Marketing Manager:
Paul Goodhead
Tel: 0207 907 6393

PRODUCTION
Production Coordinator:
John Moore
Tel: 0207 438 2074
MicroMartAdCopy@gmail.com

Digital Production Manager:
Nicky Baker

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Newstrade Director:
David Barker

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Group Publisher:
Paul Rayner
paul_rayner@dennis.co.uk

Managing Director:
John Garewal

Group Managing Director:
Ian Westwood

COO: Brett Reynolds
CEO: James Tye
Company Founder: Felix Dennis

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Traditionally I consider that the UK is classically a society of individuals, where Japan, for example, has a much more collective mindset. Yet, I'm beginning to wonder if collectivism is starting to become the norm in some Western countries too, as brands try to promote the idea of strength through loyalty and uniformity.

Lots of mobile phone networks are now promoting the idea of SIM packs that are for a whole family, allowing them to freely talk between themselves as much as they like at no extra cost. And Apple for a long time has been big on supporting only its technology for interoperability, because they argue they can offer a better user experience that way.

I'd like to think that people will do what's best for them, and not just follow others wherever that trend takes them.

Mark Pickavance

LAST WEEK'S CROSSWORD

Across: **7** Cybercriminal, **8** Regulo, **9** Tomcat, **10** Othello, **12** WS_FTP, **14** Akela, **16** Balance, **19** Anoxia, **20** Ratify, **22** Oscillographs.
Down: **1** Lyre, **2** Deduce, **3** PC World, **4** Hints, **5** Litmus, **6** Galactic, **11** Tokenism, **13** Farrago, **15** LXXIII, **17** Actual, **18** Paula, **21** Föhn.

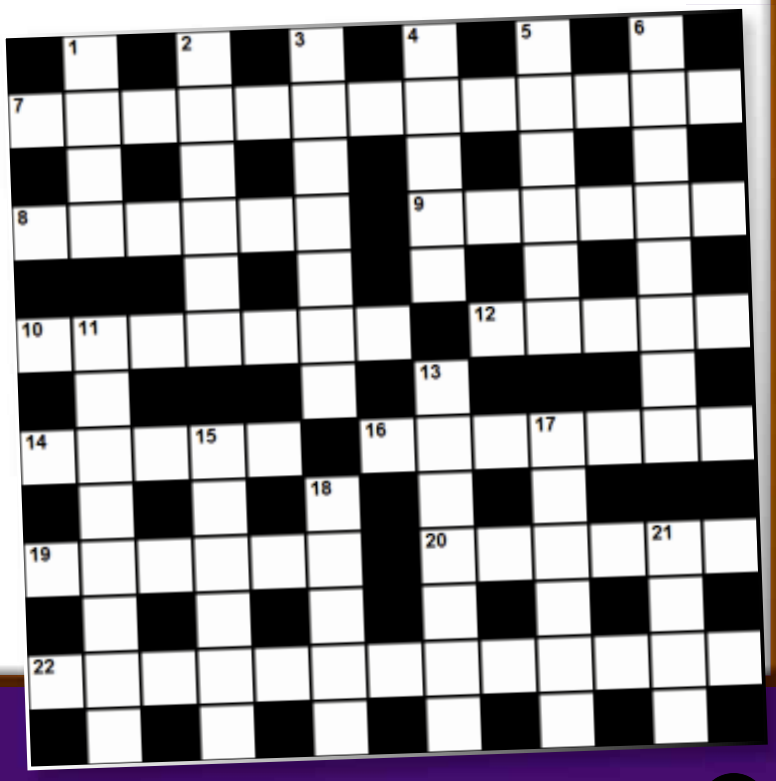
THIS WEEK'S CROSSWORD

Across

7 THIS is in them but not this? (5,8)
8 The nominative masculine plural of obtusus. (6)
9 King of England and son of Sweyn 1st best remembered for demonstrating to his courtiers his inability to stop the rising tide. (6)
10 A person who is excessively conceited or self absorbed. (7)
12 An option on a convertible bond used to separate the cash flows of the underlying bond from the equity option embedded in the convert. (Acronym) (5)
14 The sum of a person's actions in this and previous states of existence, viewed as deciding their fate in future existences. (5)
16 The popular name of the pioneering American jazz trumpeter and bandleader. (1900-1971) (7)
19 A bodyguard employed to protect a celebrity or criminal. (6)
20 Humourous or satirical mimicry. (6)
22 He designed the NCR Corp version of the p-code machine; a kind of Stack machine popular in the 70's as a way to implement new computing architectures and languages like Pascal. (4,9)

Down

1 A binary file stored as part of a database record. (Acronym) (4)
2 Involving or relating to mystical, supernatural, or magical powers or phenomena. (6)
3 The blocking or partial blocking of light from one celestial body by another celestial body. (7)
4 The half Vulcan, half human science officer of the Enterprise. (5)
5 The software-based online digital media store operated by Apple. (6)
6 The combination of a particular computer and a particular operating system. (8)
11 A hypothetical quantum of gravitational energy, regarded as a particle. (8)
13 A composition that imitates or misrepresents somebody's style, usually in a humorous way. (7)
15 In computer science a logical grouping construct which captures one perspective or view of a situation. (6)
17 The former name of programming language Oxygene, developed by RemObjects Software. (6)
18 A circular magnetic path on a magnetic disk that serve as a guide for writing and reading data. (5)
21 A standard used to automatically connect a computer to a new internet connection. (Acronym) (4)



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The views expressed by contributors are not necessarily those of the publishers. Every care is taken to ensure that the contents of the magazine are accurate but the publishers cannot accept responsibility for errors. While reasonable care is taken when accepting advertisements, the publishers cannot accept any responsibility for any resulting unsatisfactory transactions. You quite often get reminded about how you can't believe anything you see in these days of digital media, but the reality is that it's actually quite a hard concept to get your head around unless you actually get hands on with some of the technology. In the process of putting together *Micro Mart*, we obviously do get to do that quite a lot of the time, but – at the risk of winding up Laura and Kevin, our noble design team – we've spent a little bit of serious time in the company of Photoshop this week. Frankly, though. it's a genie we wished we'd never let out of the bottle. We say that because, quite simply, if people with as little talent for art as the people who write this magazine have (as opposed to those who take our words and make them legible, and interesting to look at) can achieve so much with a digital photo package after only a couple of hours of fiddling around (admittedly, we are experts at fiddling around), then the thought of what real experts can do if they put their minds to it makes us want to run and hide in a darkened room... All our selfies look nice, though.

In Next Week's Micro Mart*

- Turn Your TV Smart
- The Best Education Apps
- The Best Indie Games
- Plus the usual mix of news, reviews and advice

* May be subject to change

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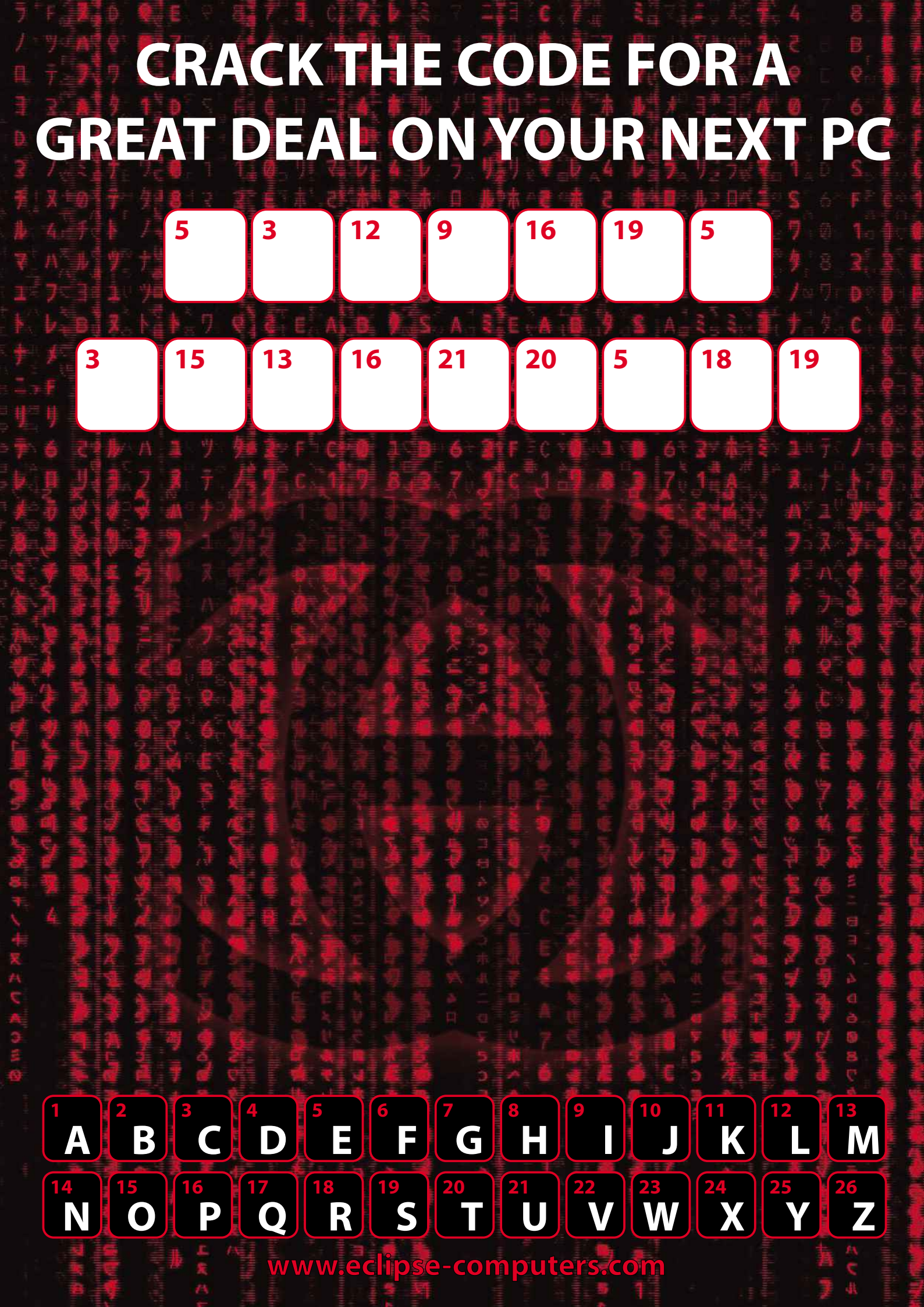

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